

MEETING OF TEAC

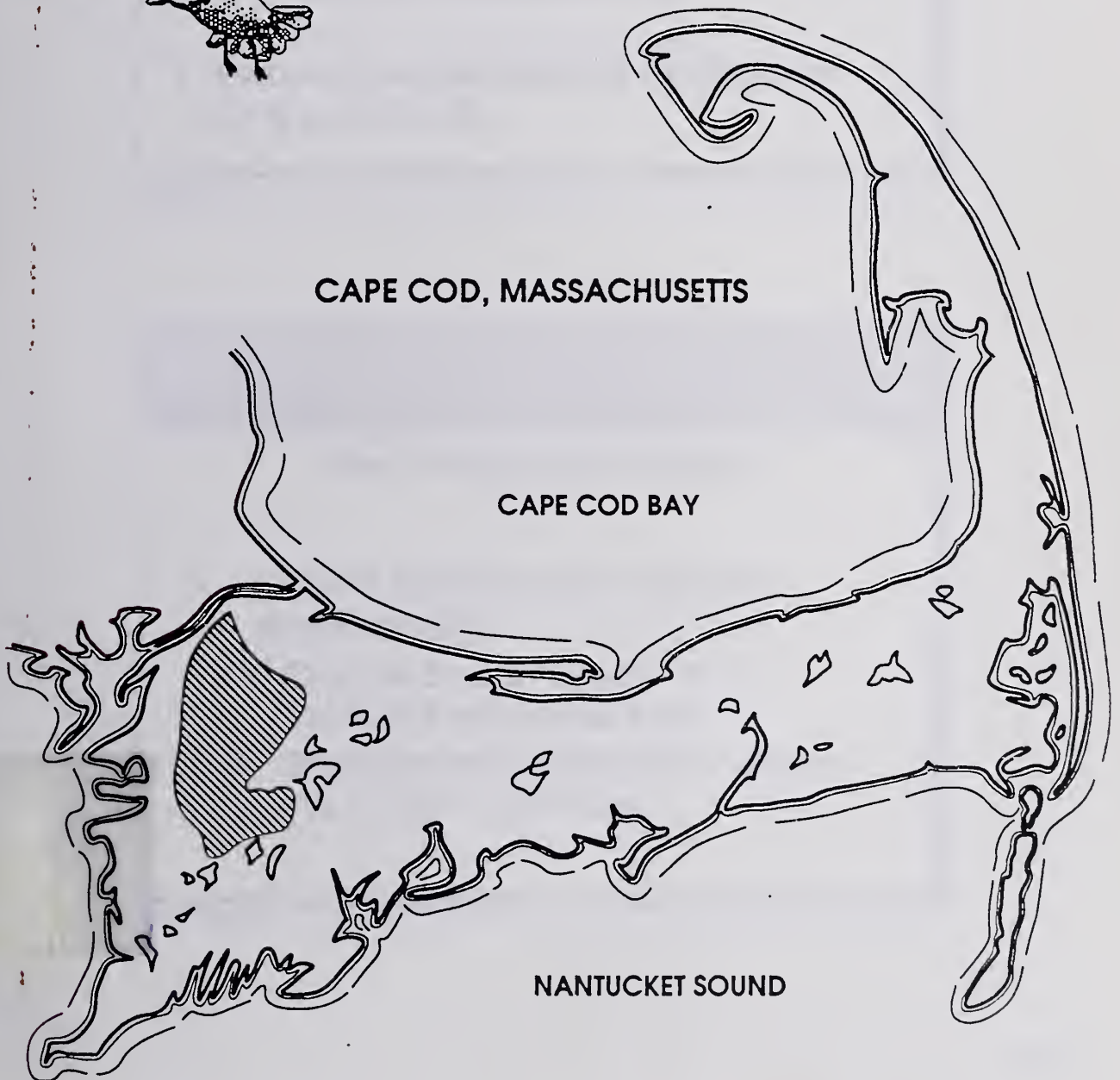
MASSACHUSETTS MILITARY RESERVATION

March 21, 1990



CAPE COD, MASSACHUSETTS

CAPE COD BAY



NANTUCKET SOUND

MASSACHUSETTS MILITARY RESERVATION

TEAC PRESENTATION OUTLINE

- ◆ Technical findings from summer 1989 Field Program.
- ◆ Pump test program for study area CS-4 groundwater operable unit.
- ◆ Removal action plans for study areas SD-5 and CS-10.

MARCH 21, 1990

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MASSACHUSETTS MILITARY RESERVATION

TEAC PRESENTATION OUTLINE
(continued)

- ◆ Closure plans for study area LF-1 (Base Landfill).
 - ◇ Closure Design Report - Post 1970 cell and Kettle Hole.
 - ◇ Environmental justification Report - 1947, 1951, 1957 Cells.

MARCH 21, 1990

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THE HISTORY OF THE

... of the ...

...

CHAPTER I

...

...

MASSACHUSETTS MILITARY RESERVATION

TEAC PRESENTATION OUTLINE
(continued)

- ◆ Ashumet Valley Hydrogeologic Study
- ◆ Inter-Agency Agreement (IAG)

MARCH 21, 1990

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MASSACHUSETTS MILITARY RESERVATION

DATA REVIEW
Summer 1989
FIELD INVESTIGATIONS

MARCH 21, 1990

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MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

- ◆ **Present Activities**
 - ◇ Evaluating analytical data from soil and groundwater.
 - ◇ Assessing risk and identifying remedial objectives.
 - ◇ Completing RI Reports for the study areas.

MARCH 21, 1990

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MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

- ◆ **Present Activities** *(continued)*
 - ◇ Assembling FS Reports and Decision Documents for study area or operable units.
 - ◇ Completing remaining groundwater sampling for downgradient monitoring wells (G-well Program, Study Area SD-2).

MARCH 21, 1990

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MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

◆ **STUDY AREA CS-10**

- ◇ Sumps, leaching wells, and soils appear to be sources of contamination.
- ◇ Groundwater contamination detected in downgradient monitoring wells.

MARCH 21, 1990

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MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

◆ **STUDY AREA CS-10** *(continued)*

- ◇ Chlorinated Solvent Plume migrating from study area. Chemical concentration several orders of magnitude greater than MCLs.

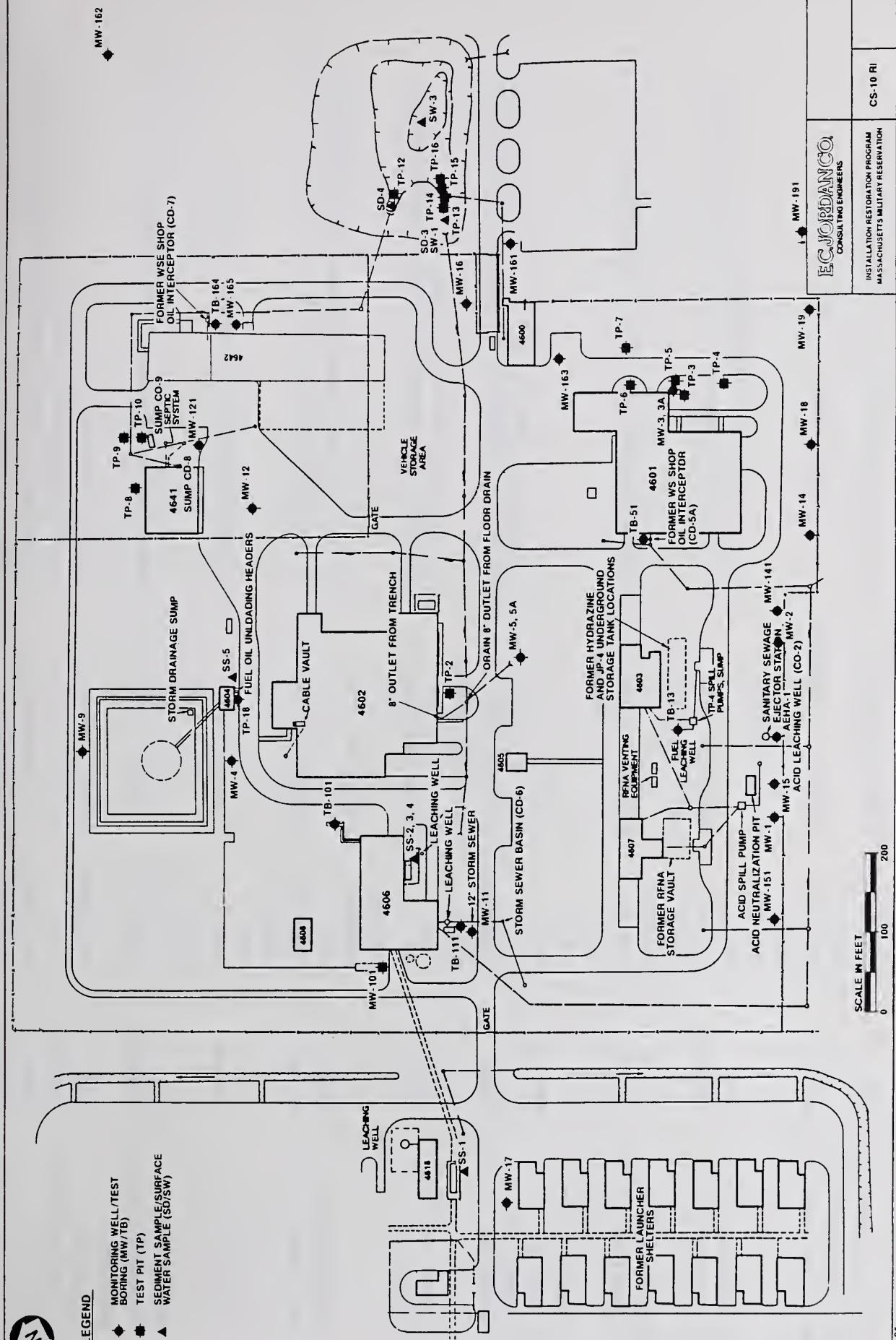
MARCH 21, 1990

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LEGEND

- ◆ MONITORING WELL/TEST BORING (MW/TB)
- TEST PIT (TP)
- ▲ SEDIMENT SAMPLE SURFACE WATER SAMPLE (SD/SW)



ECORP/ANDCO
CONSULTING ENGINEERS

INSTALLATION RESTORATION PROGRAM
MASSACHUSETTS MILITARY RESERVATION

SCALE IN FEET
0 100 200



LOCATION/IDENTIFICATION	MEDIA SAMPLED	CLASSES DETECT IN SEDIMENT	VOLUMES OF MEDIA SAMPLED	NOTES
BUILDING 4601	LIQUID	NO SEDIMENT	LIQUID = 458 GALLONS	OIL INTERCEPTOR RECEIVED DISCHARGE FROM BUILDING 4601 SHOP AREA
OIL INTERCEPTOR CD-5A	(WASTE OIL)			INTERCEPTOR DISCHARGES TO STORM SEWER
BUILDING 4602	LIQUID	NO SEDIMENT	LIQUID = 720 GALLONS	CABLE VAULT DISCHARGES TO CD-3
CABLE VAULT				
BUILDING 4602	SEDIMENT	PAHS	SEDIMENT = 0.7 CYDS	LEACHING WELL RECEIVES DISCHARGE FROM CABLE VAULT
LEACHING WELL CD-3		PEST/PCBS		
		METALS		
BUILDING 4606	SEDIMENT	VHOS	NOT DETERMINED	RECEIVED DISCHARGE FROM BUILDING 4606 FLOOR SUMPS
LEACHING WELL CD-1		PCBS		
		METALS		
BUILDING 4606	SEDIMENT	VHOS, BETX	SEDIMENT = 3.35 CYDS	LEACHING WELL HAS OVERFLOW TO CD-6
LEACHING WELL CD-4	LIQUID	PAHS		CD-4 RECEIVED DISCHARGE FROM BLOWDOWN TANK AND BUILDING 4606
		PEST/PCBS	LIQUID = 592 GALLONS	
		METALS		
BUILDING 4606	SEDIMENT	PAHS	SEDIMENT = 0.26 CYDS	LEACHING WELL HAS HARD BOTTOM, RECEIVES DISCHARGE FROM CD-4
LEACHING WELL CD-6	LIQUID	PCBS		CD-6 DISCHARGES TO STORM SEWER SYSTEM
		METALS	LIQUID = 1,480 GALLONS	
BUILDING 4606	LIQUID	NO SEDIMENT	NOT DETERMINED	BLOWDOWN TANK RECEIVED DISCHARGE FROM POWER PLANT BOILERS
BLOWDOWN TANK				DISCHARGES TO LEACHING WELL CD-4
BUILDING 4641	SEDIMENT	PAHS	SEDIMENT = 0.33 CYDS	
LEACHING WELL CD-8		PESTS		
		METALS	LIQUID = NOT DETERMINED	
BUILDING 4641	SEDIMENT	PAHS	SEDIMENT = 0.46 CYDS	LEACHING WELL CD-8 INTERCONNECTED WITH LEACHING WELL CD-9
LEACHING WELL CD-9		PEST/PCBS		
		METALS	LIQUID = NOT DETERMINED	
BUILDING 4642	SEDIMENT	VHOS, BETX	SEDIMENT = 1.8 CYDS	OIL INTERCEPTOR RECEIVED DISCHARGE FROM FORMER BUILDING 4642
OIL INTERCEPTOR CD-7	LIQUID	PAHS		INTERCEPTOR DISCHARGES TO STORM SEWER
		PEST/PCBS	LIQUID = 92 GALLONS	
		METALS		
SPECIAL FUELS HANDLING FAC	SEDIMENT	PEST/PCBS	SEDIMENT = NOT DETERMINED	RECEIVED DISCHARGE FROM RFNA NUTRALIZATION PIT
RFNA LEACHING WELL CD-2		METALS		
SPECIAL FUELS HANDLING FAC	LIQUID	NO SEDIMENT	LIQUID = NOT DETERMINED	SPILL PIT OVERFLOW DISCHARGED TO JP-4 LEACHING WELL
JP-4 SPILL PIT				
SPECIAL FUELS HANDLING FACILITY	SOIL	PHTHALATES	NOT APPLICABLE	LEACHING WELL HAD BEEN ABANDONED AND BACKFILLED
JP-4 LEACHING WELL		TR VHOS		

LOCATION/IDENTIFICATION	ENVIRONMENTAL MEDIA		FUEL OR OIL TYPE		AFFECTED SOIL VOLUME	TPH RANGE (mg/Kg)
	SAMPLED	SUSPECTED	SUSPECTED	SUSPECTED		
BUILDING 4604 FUELS PUMPHOUSE SOILS	SURFACE SOIL/FILL	NO. 2 FUEL OIL	20 CYDS	1,040 TO 3,240		
BUILDING 4606 LEACHING WELL CD-4	SUBSURFACE SOIL	MIXED WASTE OIL	1,940 CYDS	127 TO 11,400		
BUILDING 4641 ISOLATED SPILL	SURFACE SOIL	DIESEL FUEL OR WASTE OIL	6.5 CYDS	33,900 TO 41,500		
EASTERN STORM SEWER OUTFALL SOILS	NEAR SURFACE SOIL, SEDIMENT	DIESEL FUEL OR WASTE OIL	37 CYDS	1,070 TO 20,200		
SOUTHERN STORM SEWER OUTFALL SOILS	NEAR SURFACE SOIL, SEDIMENT	DIESEL FUEL OR WASTE OIL	18.5 CYDS	78 TO 2,710		

NOTES:

CYDS = CUBIC YARDS

TPH = TOTAL PETROLEUM HYDROCARBONS

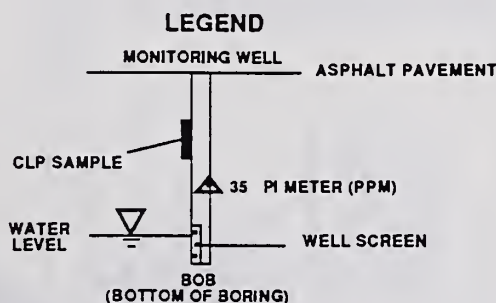
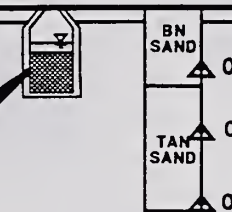
ASPHALT PAVEMENT

CD-7 TB-164

MW-165

S

CD-7	SEDIMENT
TCL VOCs*	
Methylene Chloride	470,000
1,2-Dichloroethene	730,000
Trichloroethene	190,000
Tetrachloroethene	1,100,000
Toluene	37,000
Ethylbenzene	99,000
Xylenes	260,000
TCL SVOCs*	
Naphthalene	19,000
2-Methylnaphthalene	17,000
TCL PEST/PCBs	
Aroclor-1242	2,400
Aroclor-1260	18,000
TPH	39,000 mg/kg
Total TICs (7)	18,594,000



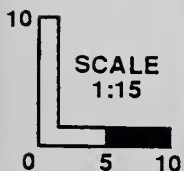
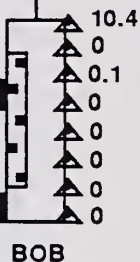
MW-165	83'-85' (SOIL)
TCL VOCs	ND*
TCL SVOCs	ND
TPH	21.5 mg/kg
Total TICs (2)	580 ug/kg

MW-165	93'-95' (SOIL)
TCL VOCs	ND*
TCL SVOCs	ND
TPH	ND
Total TICs (1)	470 ug/kg

* Reported as ug/kg unless noted.

INTERPRETIVE
GROUNDWATER FLOW DIRECTION

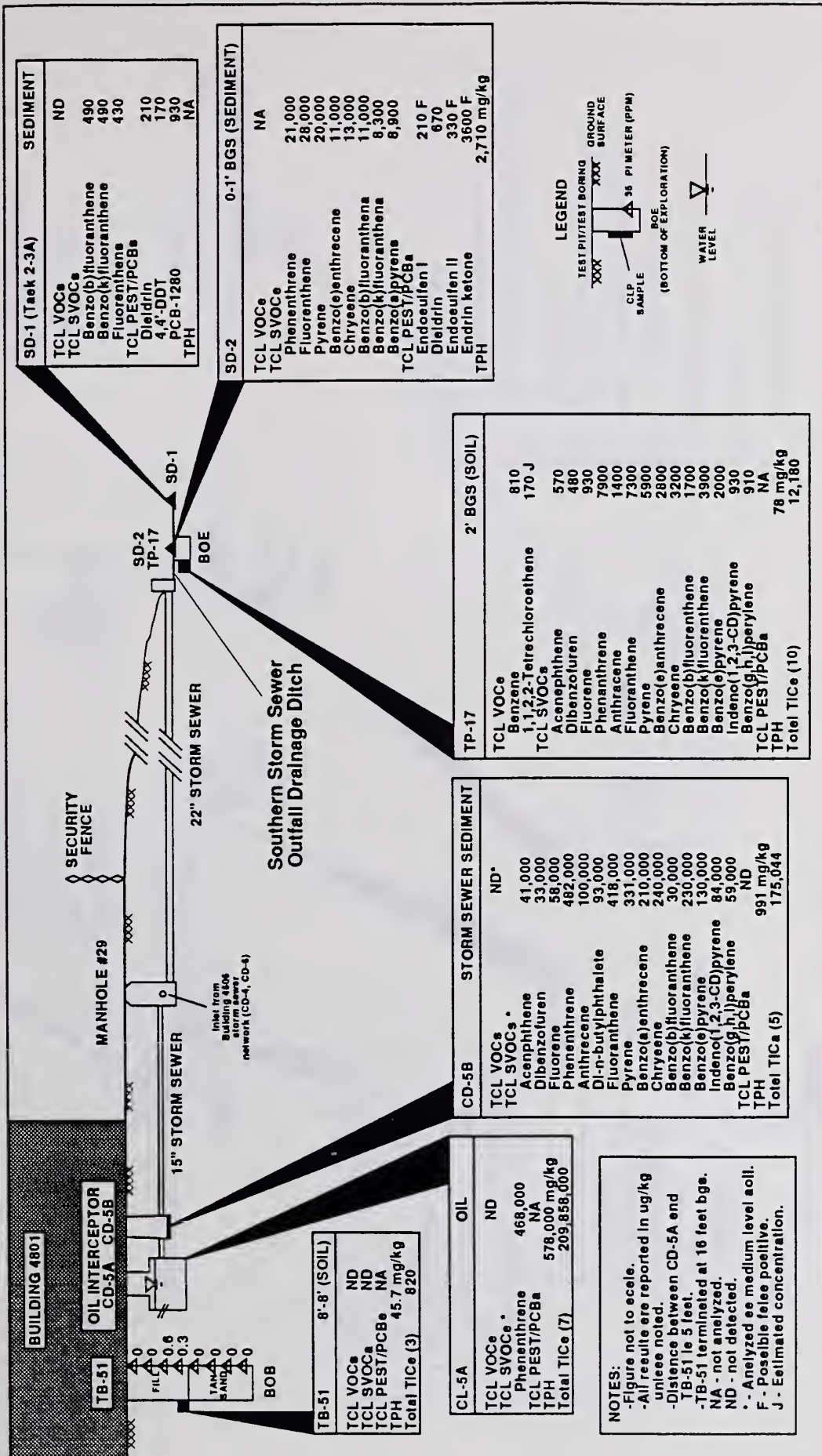
BORING ADVANCED THROUGH TAN SAND WITHOUT SAMPLING TO 79' BGS



NOTES:
All results are reported in ug/kg unless noted.
Only maximum concentrations of VOCs in CD-7 are shown.
ND - not detected.
* - medium level soil analysis.

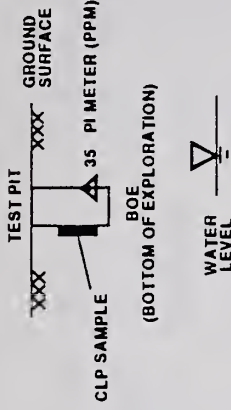
MW-165	GROUNDWATER
	10/11/89
TCL VOCs	
1,2-Dichloroethene	54 ug/L
Trichloroethene	1 ug/L
Tetrachloroethene	31 ug/L
TCL SVOCs	
	ND







LEGEND



SD-3	SEDIMENT
TCL VOCs	9,700
Methylene Chloride	710
TCL SVOCs	120
Bis(2-ethylhexyl)phthalate	860
TCL PEST/PCBs	3,030 mg/kg
Dieldrin	24,190
Aroclor-1254	
TPH	
Total TICs (2)	

TP-13

SD-3

COBBLE RIP-RAP

15" STORM SEWER FROM BUILDING 4403 AREA

BOE

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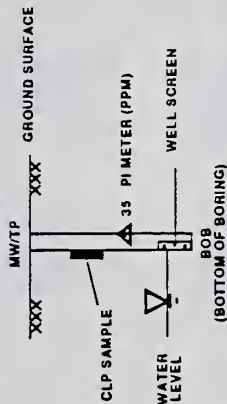


N

NOTES:

All results are reported in ug/kg unless noted.
 NA - not applicable.
 ND - not detected.
 * - medium level soil analysis.
 J - estimated concentration.

LEGEND



OIL STAINED
SAND AND GRAVEL

TP-9

TP-9

1.0 bgs (SOIL)	ND*
TCL VOCs	ND*
TCL SVOCs	58000
2-Methylnaphthalene	8700 J
4-Nitrophenol	22000
Phenanthrene	33900
TPH	

CD-9

CD-9	SEDIMENT
VOCs	ND*
SVOCs	ND*
Pest/PCBs	140
Dieldrin	680
Aroclor-1254	15600 mg/kg
TPH	

CD-8

CD-8	SEDIMENT
VOCs	ND*
SVOCs	420 JX
Fluoranthene	2600 E
bis(2-Ethylhexyl)phthalate	84
Pest/PCBs	19700 mg/kg
Dieldrin	
TPH	

MW-121

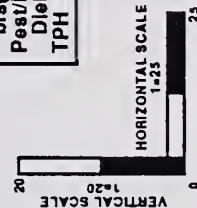
BORING ADVANCED THROUGH TAN SAND TO 84' BGS WITHOUT SAMPLING

MW-12

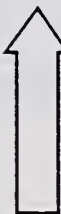
BORING ADVANCED THROUGH TAN SAND FROM 2.5' TO 79' BGS WITHOUT SAMPLING

MW-12	GROUNDWATER
TCL VOCs	10/12/89
Trichloroethene	2 ug/L
Tetrachloroethene	12 ug/L
TCL SVOCs	ND
TPH	NA

MW-121	GROUNDWATER
TCL VOCs	10/12/89
Tetrachloroethene	5 ug/L
TCL SVOCs	ND*
TPH	NA



INTERPRETIVE
GROUNDWATER FLOW DIRECTION



S

BUILDING 4606

CD-4 TB-111

MW-11

S

CD-4 SEDIMENT *	
TCL VOCs	
1,2-Dichloroethene	64,000
Trichloroethene	11,000
Tetrachloroethene	200,000
Toluene	3,400
Xylenes	5,000
TCL SVOCs	
Naphthalene	12,000
Phenanthrene	5,600
TCL PEST/PCBs	
Heptachlor epoxide	360 J
Aroclor-1260	12,000 J
TPH	160,000 mg/kg

TB-111 19'-21' (SOIL)

TCL VOCs	ND*
TCL SVOCs	ND
TPH	636 mg/kg
Total TICs (3)	37,180

TB-111 24'-26' (SOIL)

TCL VOCs	ND*
TCL SVOCs*	ND*
2-Methylnaphthalene	15,000 J
TPH	11,400 mg/kg
Total TICs (2)	2,139,000

TB-111 29'-26' (SOIL)

TCL VOCs	ND*
TCL SVOCs*	ND*
2-Methylnaphthalene	14,000
TPH	6,350 mg/kg
Total TICs (2)	609,000

3-111 84'-86' (SOIL)

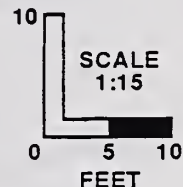
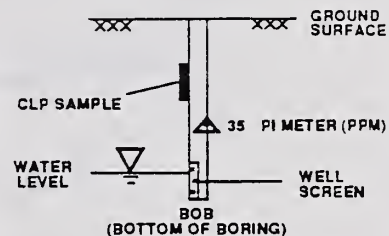
TCL VOCs	ND*
TCL SVOCs	ND
TPH	127 mg/kg
Total TICs (3)	2,340

MW-11

GROUNDWATER/DUP
10/12/89

TCL VOCs	
Trichloroethene	1.0/1.0 ug/L
Tetrachloroethene	41/39 ug/L
TCL SVOCs	
2-Methylnaphthalene	190/170
Phenanthrene	31/23
Bis(2-ethylhexyl)phthalate	13/330 D
TPH	ND/ND

LEGEND



NOTES:
-All results are reported in ug/kg unless noted.
-Subsurface soils and groundwater were not analyzed for TCL PEST/PCBs.
ND - not detected.
D - Concentration from dilution run.
J - Estimated concentration.
* - medium level analysis.

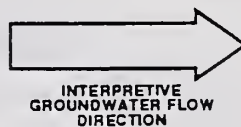
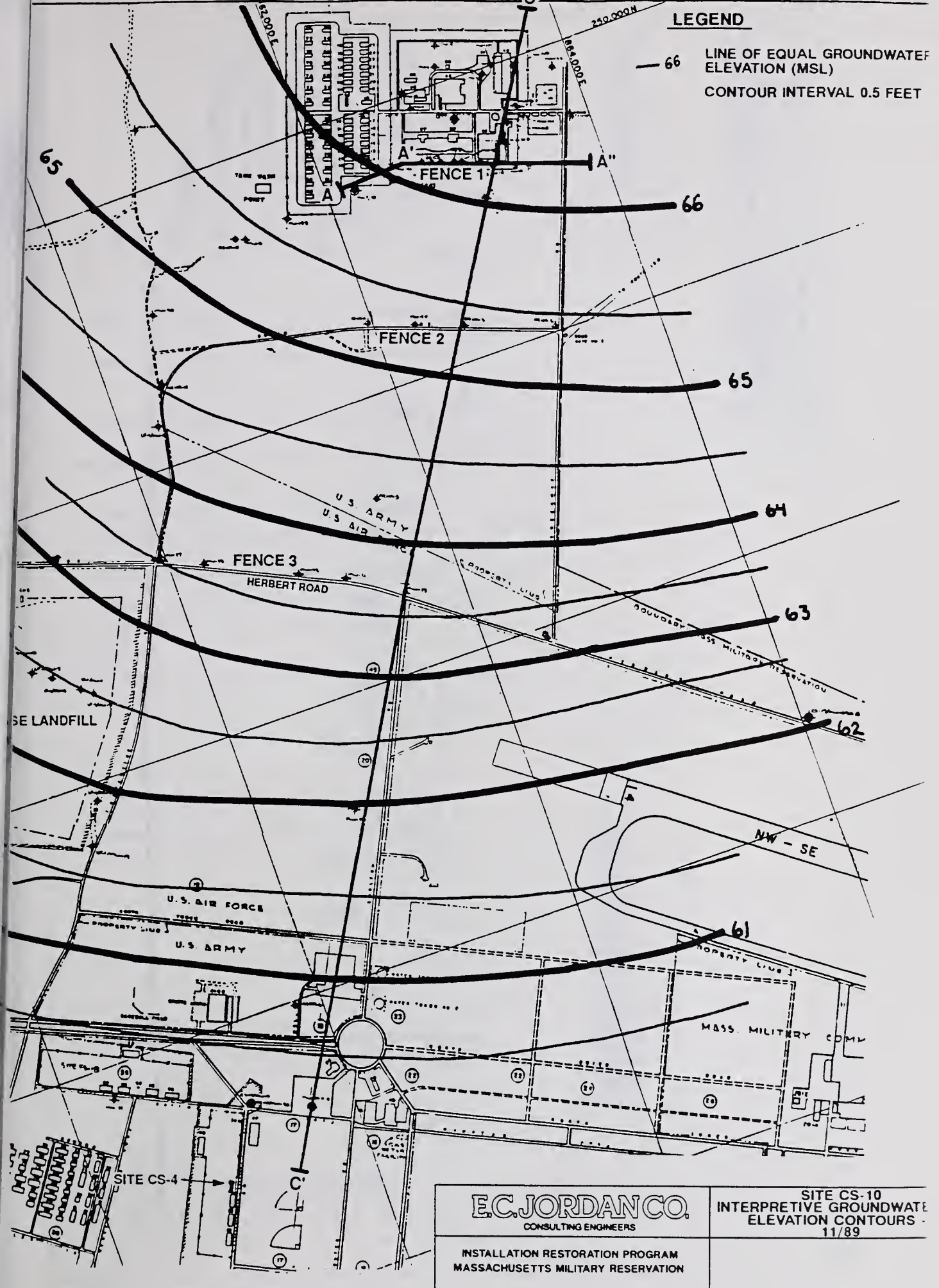


Fig 7-3

LEGEND

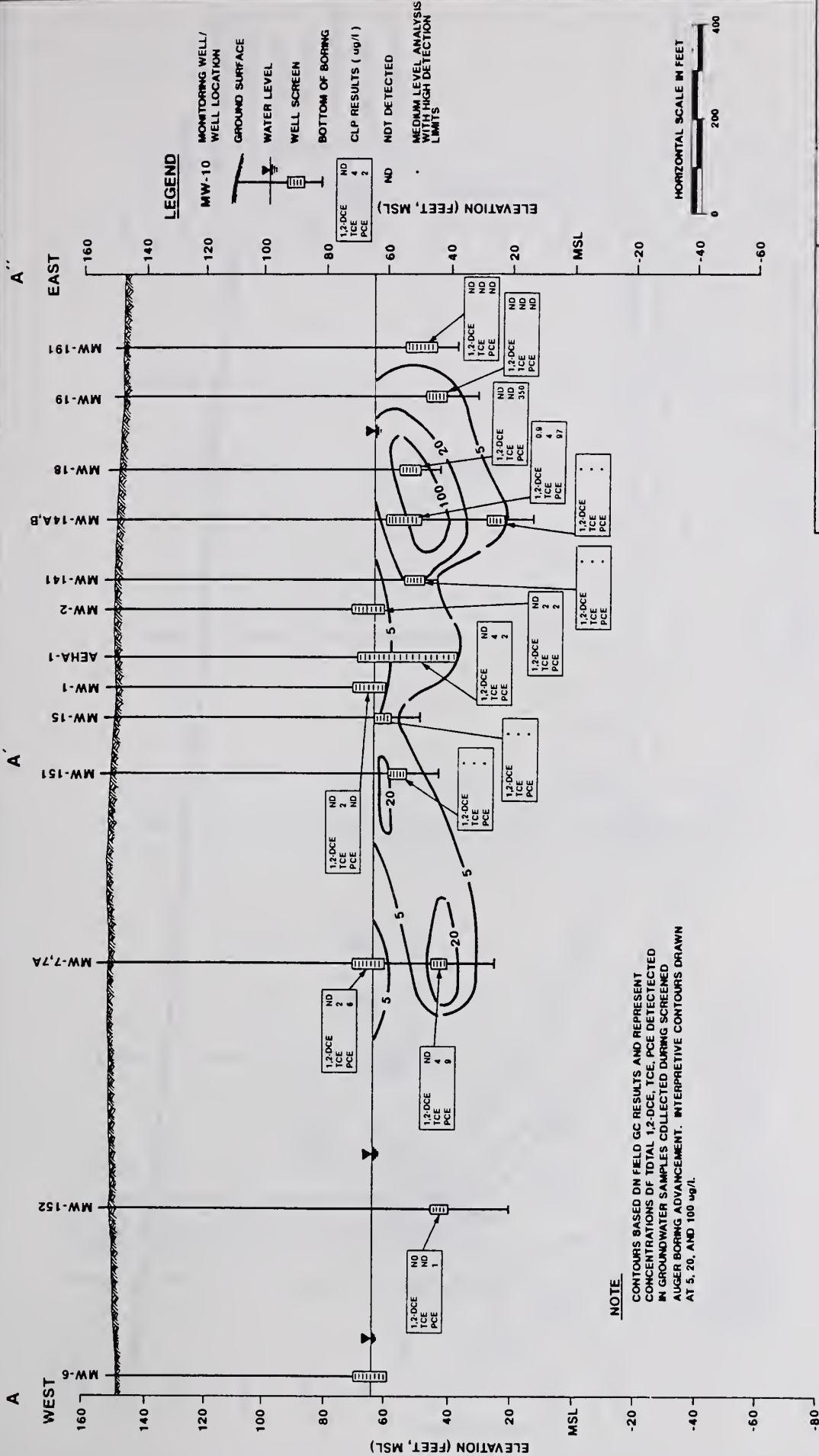
— 66 LINE OF EQUAL GROUNDWATER ELEVATION (MSL)
CONTOUR INTERVAL 0.5 FEET



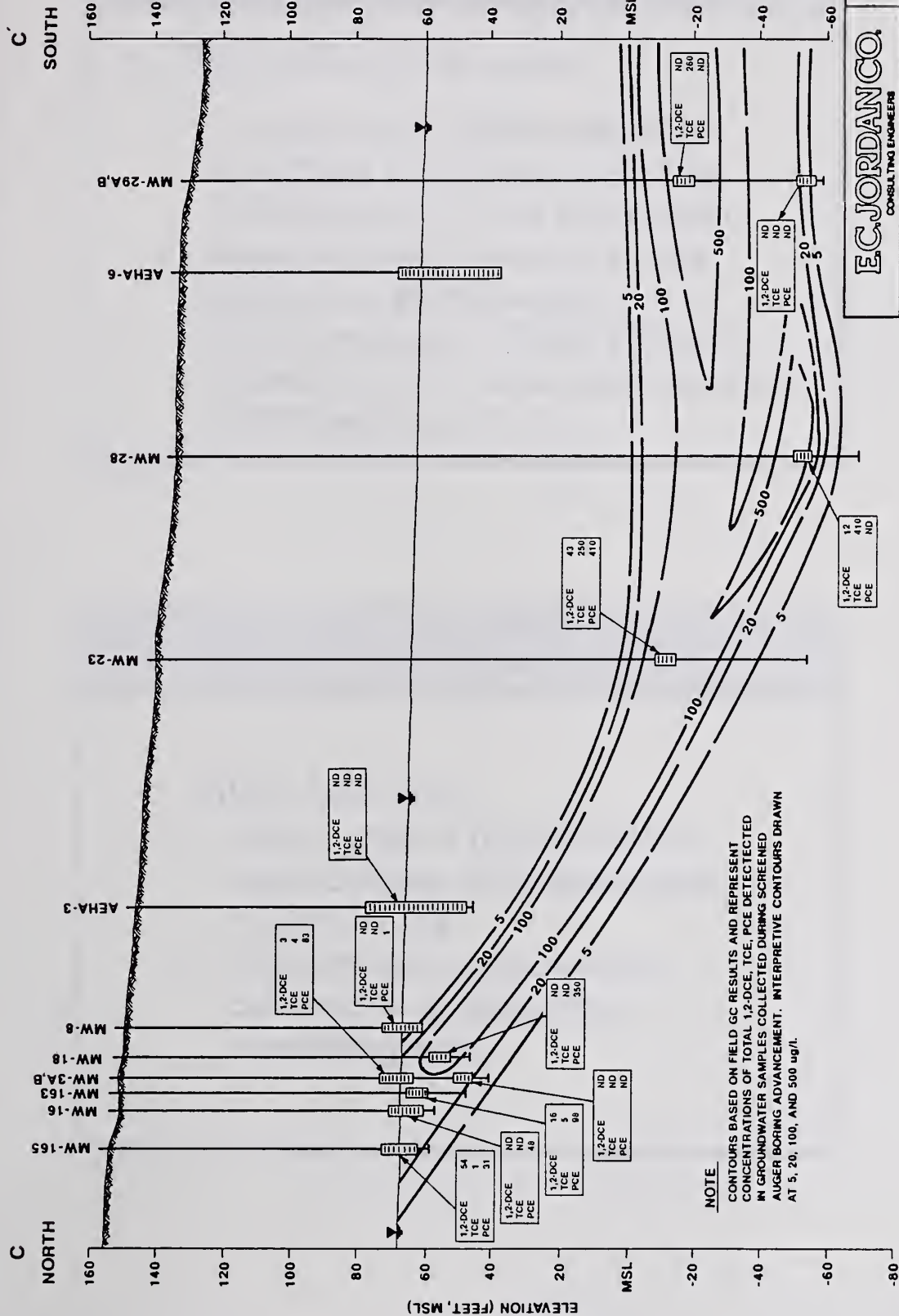
E.C. JORDAN CO.
CONSULTING ENGINEERS

INSTALLATION RESTORATION PROGRAM
MASSACHUSETTS MILITARY RESERVATION

SITE CS-10
INTERPRETIVE GROUNDWATER
ELEVATION CONTOURS -
11/89



ECJORDAN CO. CONSULTING ENGINEERS	SITE CS-10 INTERPRETIVE GROUNDWATER CONTAMINATION PROFILE A-A'-A'
INSTALLATION RESTORATION PROGRAM MASSACHUSETTS MILITARY RESERVATION	TASK 2-5
	FIGURE



EC JORDAN CO.
CONSULTING ENGINEERS

**SITE CS-10 INTERPRETIVE
GROUNDWATER CONTAMINATION
PROFILE SECTION C-C**

**INSTALLATION RESTORATION PROGRAM
MASSACHUSETTS MILITARY RESERVATION**

**TASK
2-5**

FIGURE



MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

◆ **STUDY AREA CS-10** *(continued)*

- ◇ To date contamination detected to Gaffney Road (Approximately 7500 feet south of the study area)
- ◇ Based on time of study area use, estimate of plume length approximately 9,100 feet from site. (Projected worst case length approx. 13,000 feet from CS-10.)

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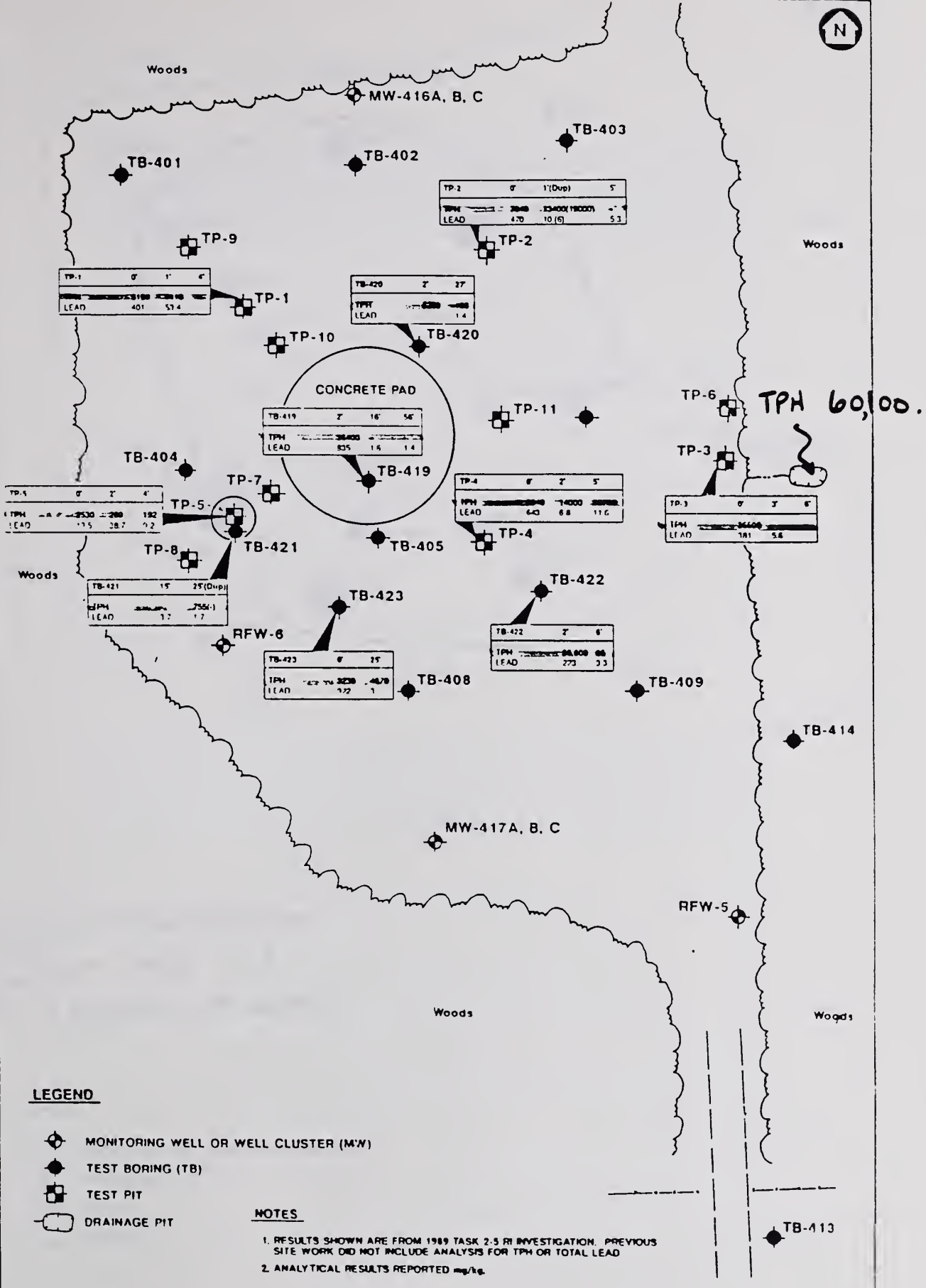
MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

◆ **STUDY AREA FTA-1**

- ◇ Source area of Total Petroleum Hydrocarbons (TPH) delineated in surficial soil.
- ◇ Groundwater contamination detected in downgradient monitoring wells

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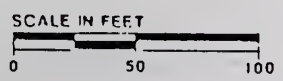


LEGEND

- MONITORING WELL OR WELL CLUSTER (MW)
- TEST BORING (TB)
- TEST PIT
- DRAINAGE PIT

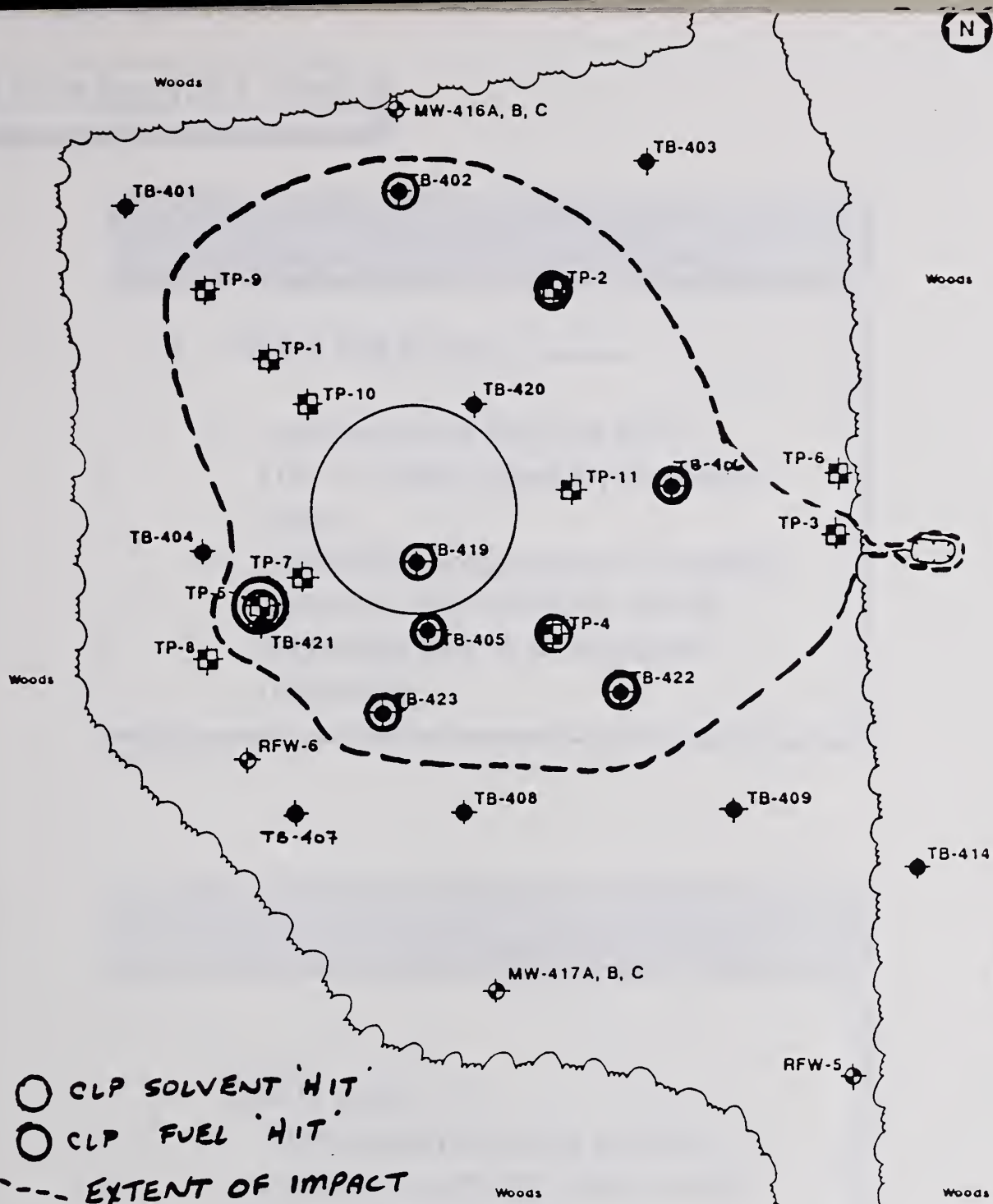
NOTES

1. RESULTS SHOWN ARE FROM 1989 TASK 2.5 RI INVESTIGATION. PREVIOUS SITE WORK DID NOT INCLUDE ANALYSIS FOR TPH OR TOTAL LEAD
2. ANALYTICAL RESULTS REPORTED mg/kg.



EC/JORDAN/CO CONSULTING ENGINEERS		FTA-1 DISTRIBUTION OF TPH AND LEAD IN SHALLOW SITE SOILS	
INSTALLATION RESTORATION PROGRAM MASSACHUSETTS MILITARY RESERVATION		TASK	2.5





○ CLP SOLVENT 'HIT'
○ CLP FUEL 'HIT'
--- EXTENT OF IMPACT

LEGEND

- ⊕ MONITORING WELL OR WELL CLUSTER (MW)
- TEST BORING (TB)
- ⊠ TEST PIT
- ◻ DRAINAGE PIT



ECJORDANCO CONSULTING ENGINEERS			
INSTALLATION RESTORATION PROGRAM MASSACHUSETTS MILITARY RESERVATION		TASK 2-5	



MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

◆ **STUDY AREA FTA-1** *(continued)*

- ◇ Contaminants migrate from FTA-1 to area beneath treatment plant.
- ◇ Additional groundwater sampling has been performed to further delineate plume boundaries (Laterally).

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MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

◆ **STUDY AREA LF-1**

- ◇ Chlorinated Solvents and Fuel-related constituents detected in downgradient wells.
- ◇ MCLs exceeded in wells north of Connery Ave.

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Section 1: Introduction

The purpose of this document is to provide a comprehensive overview of the project's goals, objectives, and scope. This section will outline the key findings and recommendations derived from the research conducted.

1.1 Project Overview

The project was initiated to address the challenges faced by the organization in the current market environment. The primary objective was to identify the root causes of the issues and develop effective solutions to improve performance.

1.2 Scope of the Study

The study focused on the internal processes and systems that impact the organization's efficiency and effectiveness. It involved a thorough analysis of the existing data and a consultation with key stakeholders.

Section 2: Analysis and Findings

This section presents a detailed analysis of the data collected during the project. It identifies the key trends, patterns, and areas of concern that have led to the current situation.

2.1 Data Analysis

The data analysis revealed several critical areas for improvement. The most significant findings include a lack of clear communication channels, inefficient workflow processes, and a need for more robust data management systems.

2.2 Key Findings

The research identified three main areas of concern: 1) Communication gaps between departments, 2) Inefficient use of resources, and 3) Outdated technology infrastructure. These findings are the basis for the recommendations provided in the next section.

315-61'
MEK 220

MW-416A, B, C

416C
PCE 7 J
MEK 30



DRAINAGE PIT.

1,2 DCE 58
PCE 24
TCE 9
MEK 38

417A, B, C

417C
1,2 DCE 41
PCE 3 J
MEK 170

RFW-5

1,2 DCE 5
PCE 5

ABND WHO WELL

SDW-309

ROAD

MOU-1

425B

424B

426B

430

KITTREDGE

CLEAN @
NATE-TAKE

1,2 DCE 168
PCE 20 J
MEK 280

1,2 DCE 12
PCE 17
TCE 5

MEK 6700

1,2 DCE 18 J
PCE 20
MEK 220

MEK 34000

MEK 22000

DONNED FILTER BEDS

1,2 DCE 200
BENZ. 12
E-BEN 56

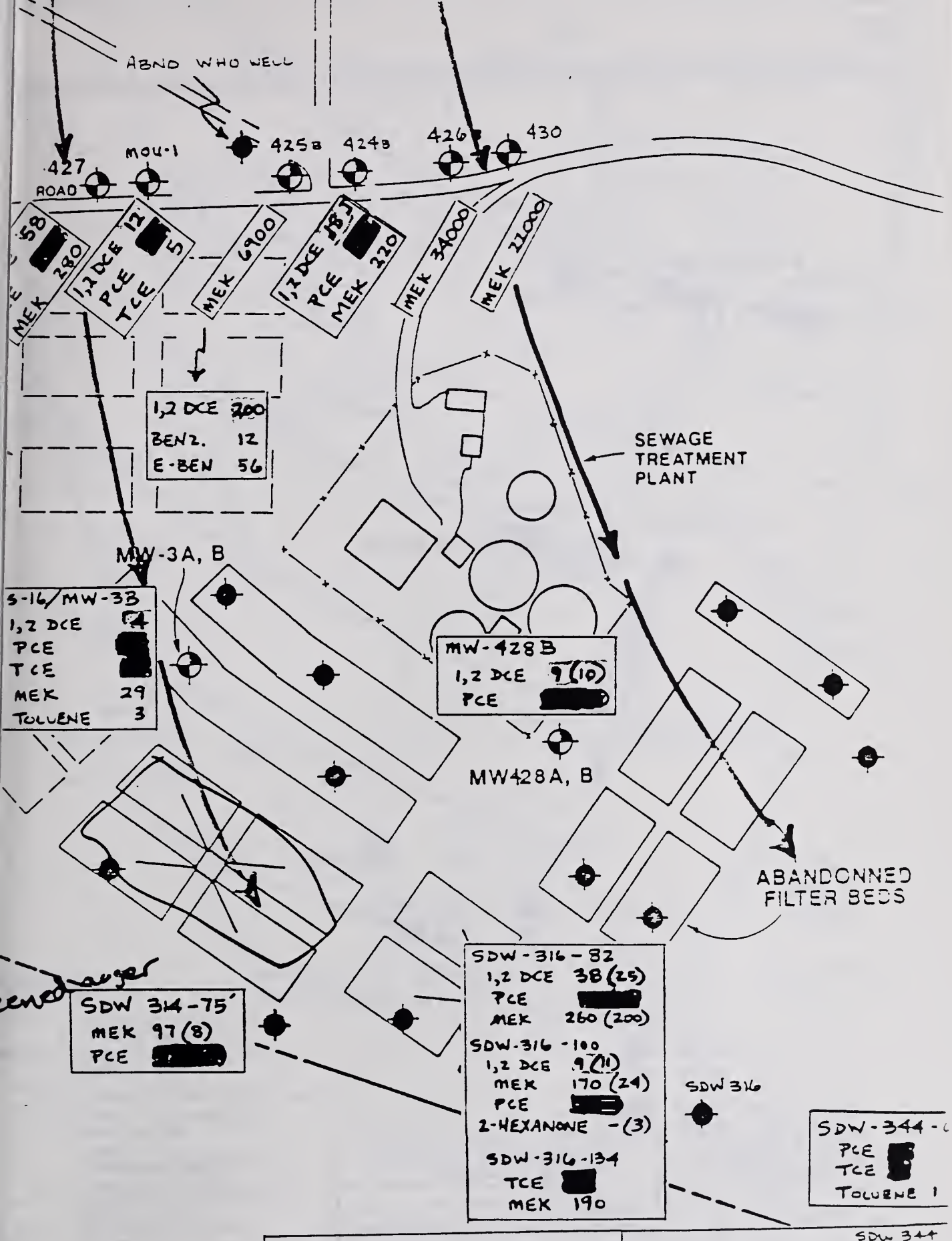
80
2%

MW-3A, B

SEWAG
TREAT
PLANT

9/6

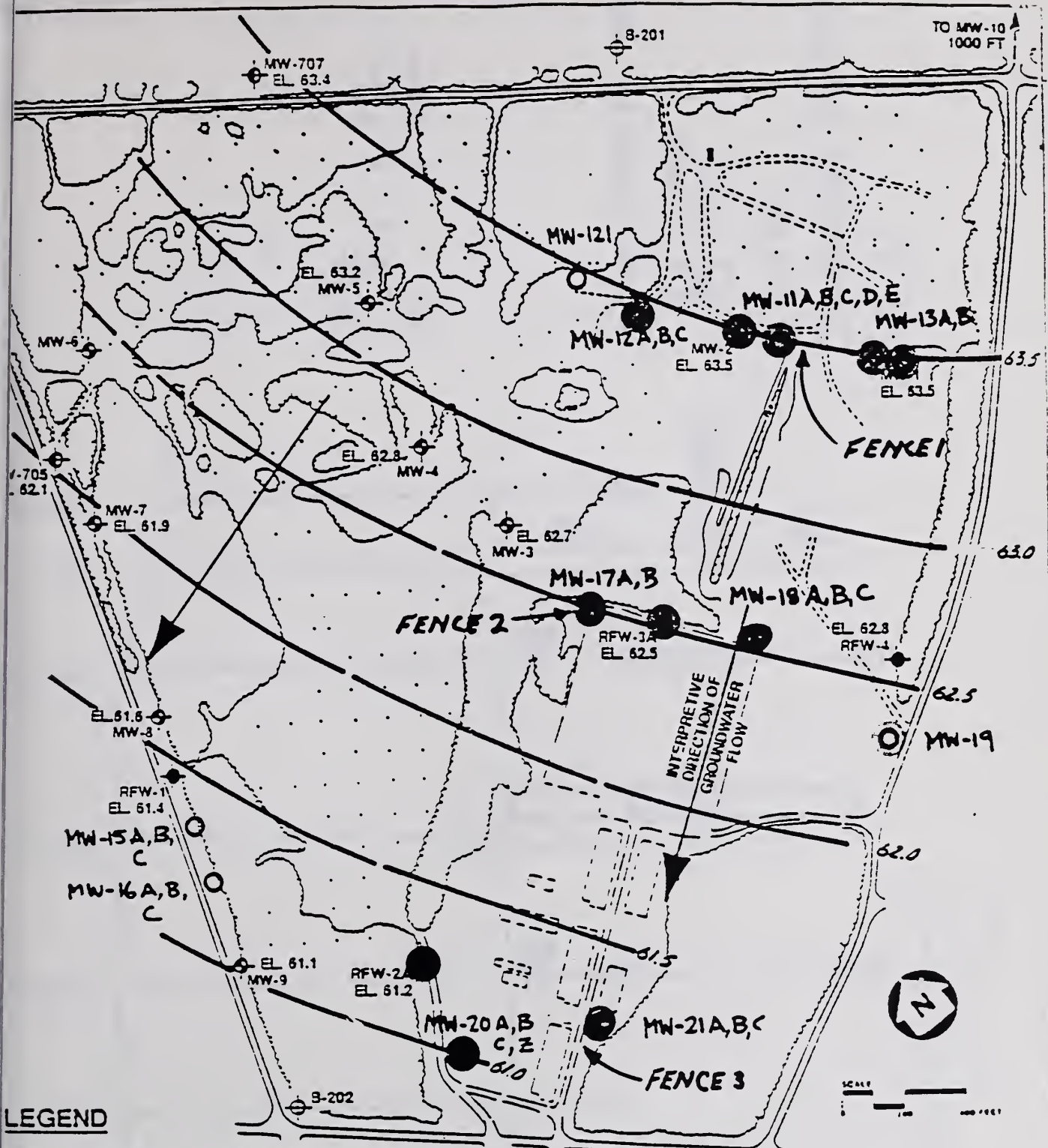




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INSTALLATION RESTORATION PROGRAM
MASSACHUSETTS MILITARY RESERVATION

TASK
2-5



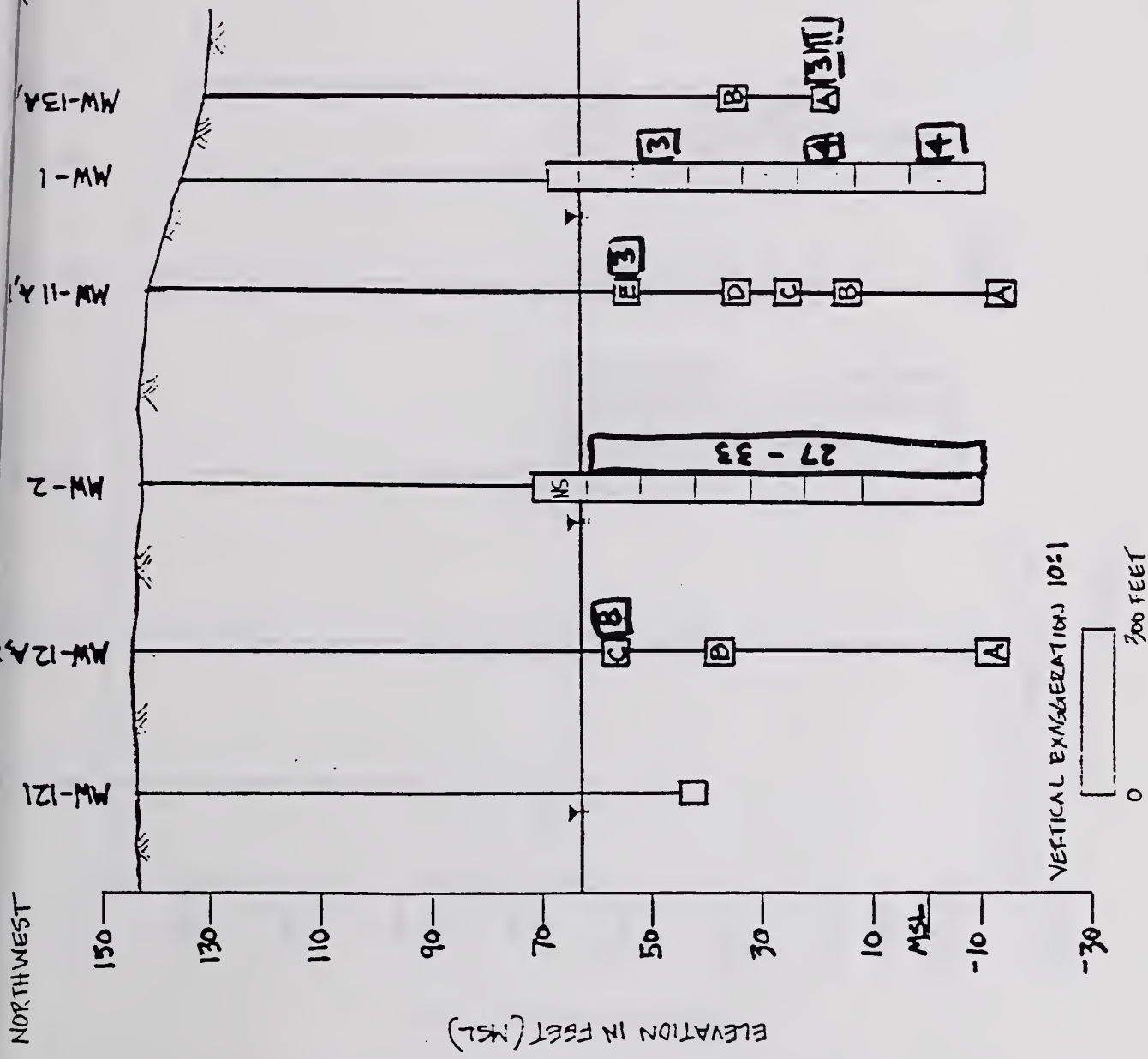
LEGEND

- RFW-1 ● EXISTING MONITORING WELL (WESTON 1985)
- MW-705 ● EXISTING WATER TABLE WELL (JORDAN 1987)
- B-201 ● GEOLOGIC BORING (JORDAN 1986)
- MW-5 ● TASK 2-3 MONITORING WELL (JORDAN 1988)
- SURVEY POINT (100x100 GRID COORDINATE SYSTEM)
- INTERPRETIVE GROUNDWATER CONTOUR (9/29/88)
- EL 63.4 WATER TABLE ELEVATION (FEET, MSL)

- DCE
- TCE
- DCE, TCE, PCE

EC JORDAN CO. CONSULTING ENGINEERS		BASS LANDFILL (SITE LF-1) INTERPRETIVE GROUNDWATER CONTOUR MAP	
INSTALLATION RESTORATION PROGRAM MASSACHUSETTS MILITARY RESERVATION		TASK 2-3B	FIGURE 6-81

PROJECT MHT TASK 2-5 CROSS SECTION A-A' BASE LANDFILL	
COMP. BY	CHK. BY
JOB NO.	DATE



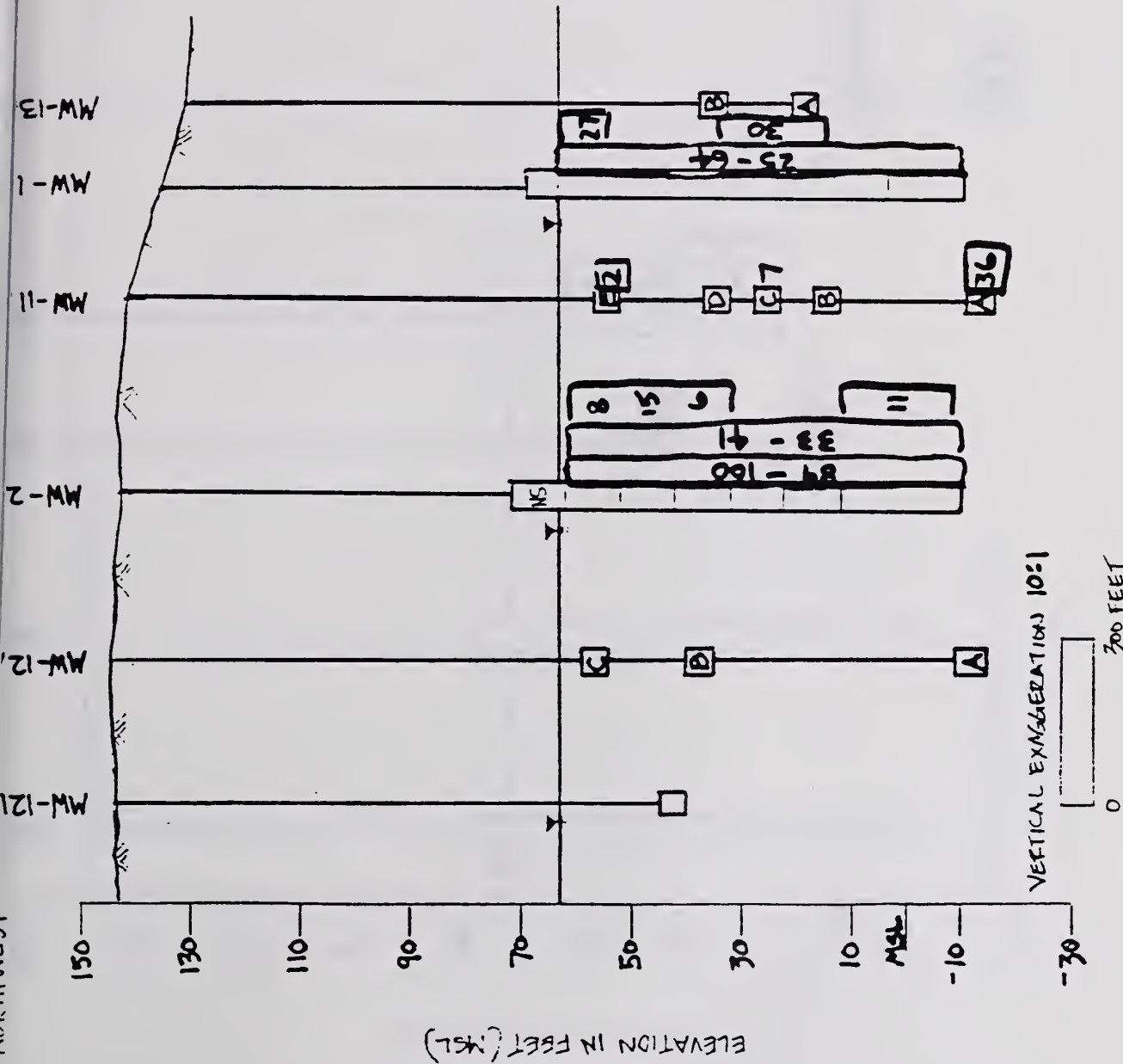
MCLs

1,2-DCE = 7 PPB

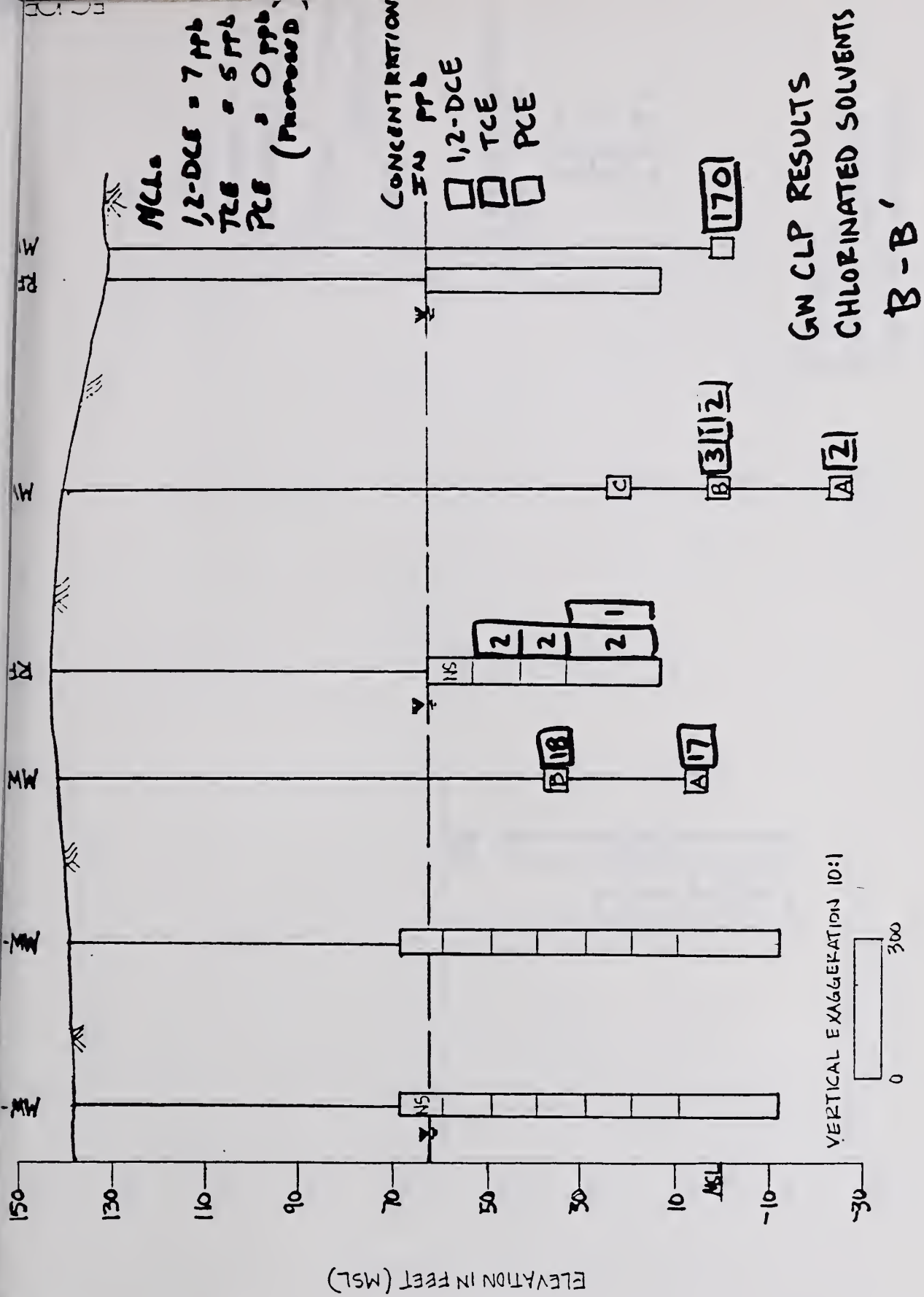
TCE = 5 PPB

ECUCRDAN

PROJECT MMT TASK 2-5 CROSS SECTION A-A' BASE LANDFILL	
COMP. BY	CHK. BY
JOB NO.	DATE



PROJECT MMR TASK 2-5 CROSS SECTION B-B' BASE LANDFILL	
COMP. BY	CHK. BY
JOB NO.	DATE



PROJECT MMR TASK 2-5
 CROSS SECTION B-B'
 BASE LANDFILL

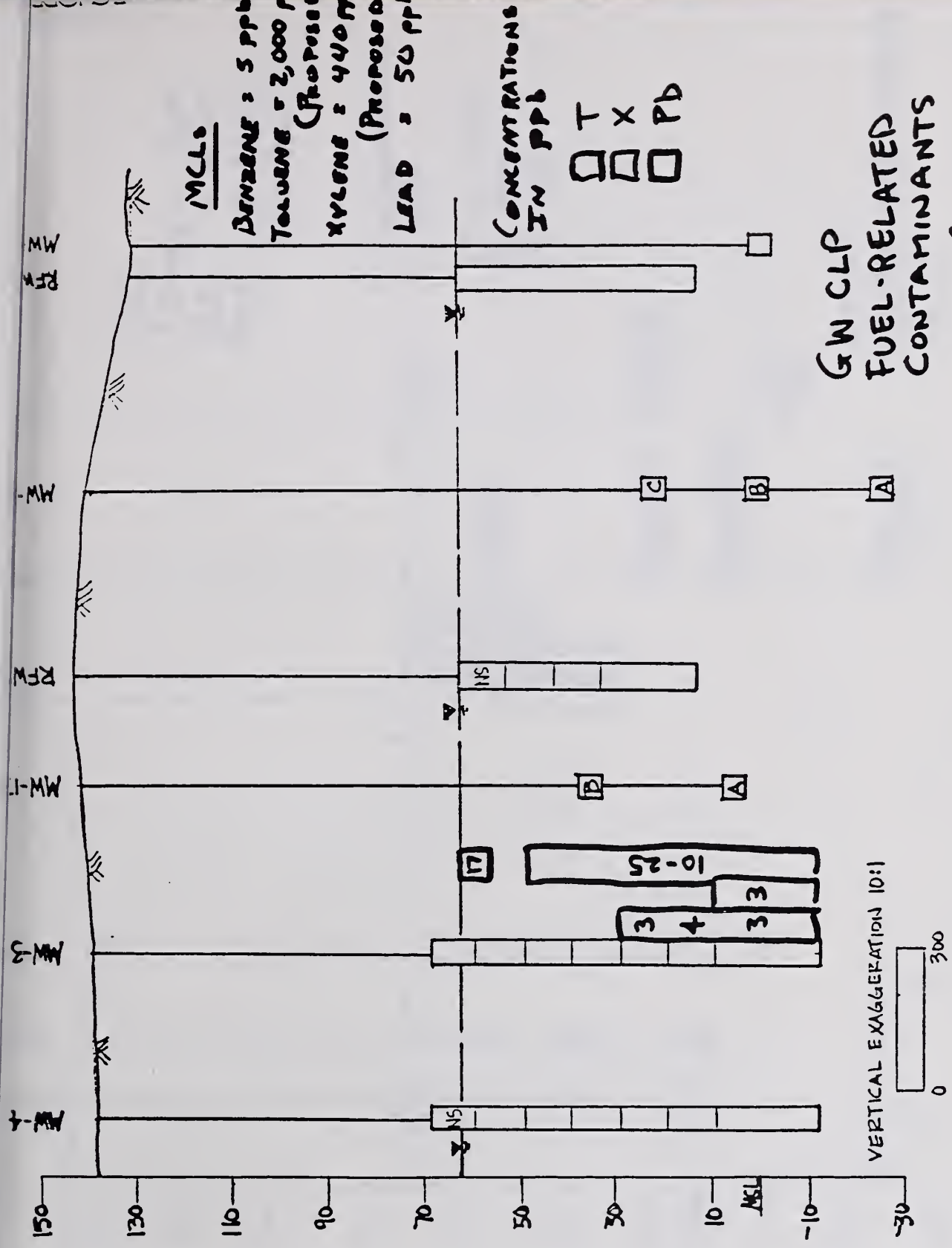
COMP. BY

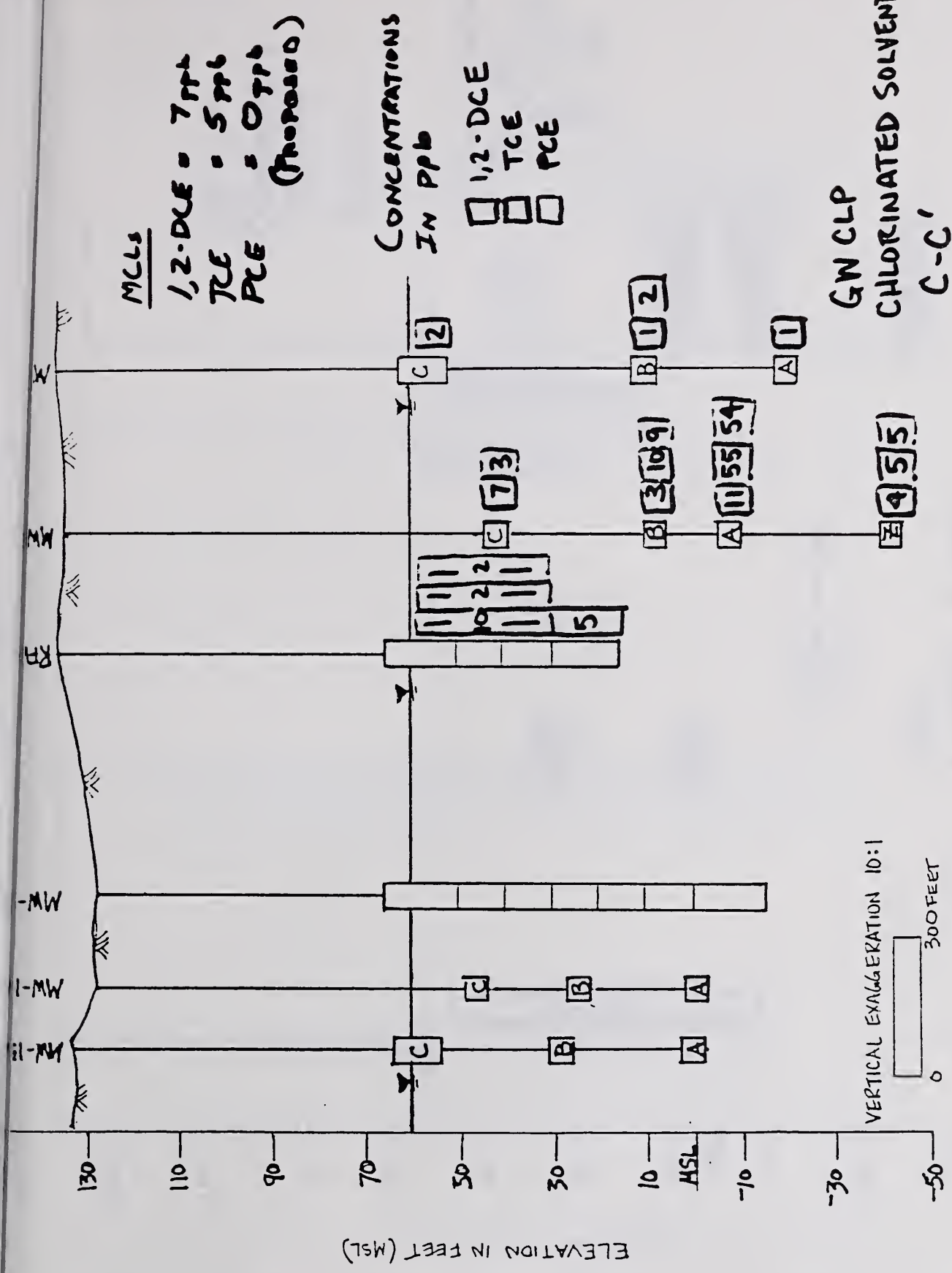
CHK. BY

JOB NO.

DATE

ELEVATION IN FEET (MSL)





PROJECT MMR TASK 2-5 CROSS SECTION C-C'	
COMP. BY	CHK. BY
JOB NO.	DATE

24/3

5/15

11/11

11/11

28/2

11/11

24/4

11/11

11/11

11/11

11/11

11/11

MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

- ◆ **STUDY AREA LF-1** *(continued)*
 - ◇ Groundwater sampling program will be performed to delineate contamination south of Connery Ave.

MARCH 21, 1990

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MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

- ◆ **STUDY AREA FS-1**
 - ◇ Residual soil contamination detected at water table (Fuel-related Constituents).
 - ◇ Second turnaround area identified as former source.

MARCH 21, 1990

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SOIL CLT RESULTS

TB-5	48-60'	64-80'
VOCs	.	.
SVOCs	.	.
TPH	.	2.1
Pb	.	.

MW-6	15-17'	48-60'
VOCs	.	.
SVOCs	.	.
TPH	.	1.3
Pb	.	1.7

TB-411	64-80'
VOCs	.
TICs	.
Oxalene	185700
Hexane	240000
Heptane	250000
SVOCs	.
TPH	.
Pb	.

MW-7	30-32'	48-60'	66-87'
MeCl	110000	.	140000
SVOCs	.	.	.
TPH	.	55.8	.
Pb	1.1	4.8	.

MW-413	66-87'
VOCs	.
TICs	.
Pentane	32
Hexane	.
SVOCs	.
TPH	.
Pb	.

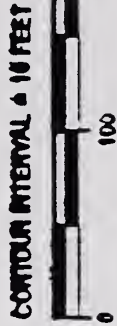
MW-8	47-49'	60-82'	66-87'
MeCl	70000	140000	.
SVOCs	23000	.	.
TPH	83/234	.	.
Pb	3/3	1.9	.

LEGEND

- WATER TABLE MONITORING WELL LOCATION (TASK 2-3)
- SOIL BORING LOCATION (TASK 2-3)
- EXISTING MONITORING WELL LOCATION (THE WESTON 1984)
- SOIL GAS PROBE LOCATION (TASK 2-3)
- PROPOSED MONITORING WELL
- PROPOSED SOIL BORING
- PROPOSED MULTILEVEL WELL CLUSTER

AXIWAY E

INTERPRETIVE GROUNDWATER FLOW DIRECTION



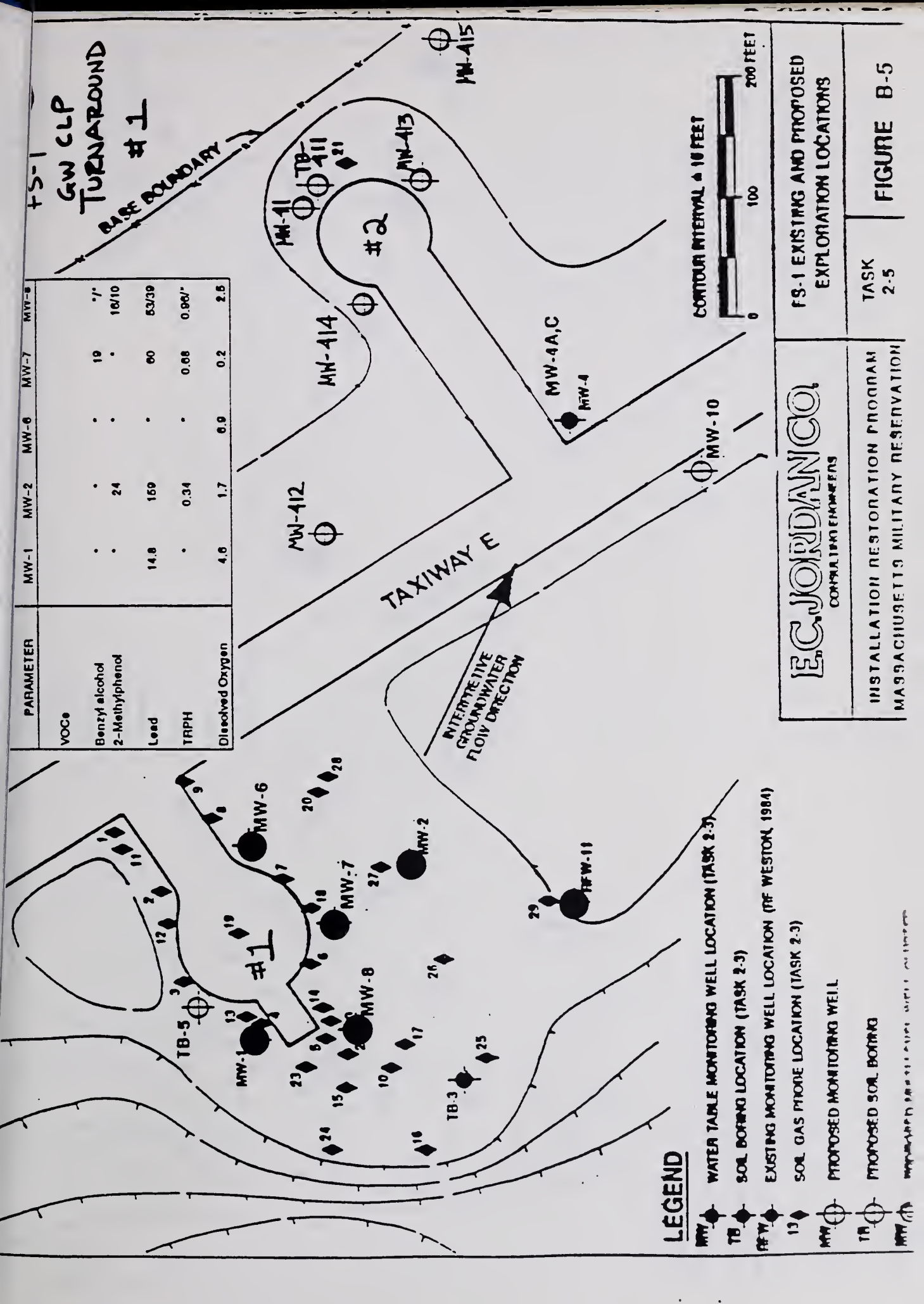
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FS-1 EXISTING AND PROPOSED
EXPLORATION LOCATIONS

INSTALLATION RESTORATION PROGRAM
MASSACHUSETTS MILITARY RESERVATION

TASK
2-5

FIGURE B-5



FS-1
GW CLP
TURNAROUND #2

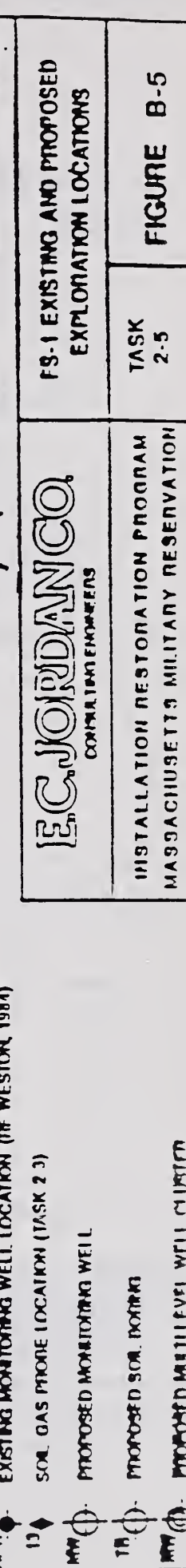


FIG. 1 EXISTING AND PROPOSED EXPLORATION LOCATIONS

TASK 2-5

FIGURE B-5

WW		WATER TABLE MONITORING WELL LOCATION (TASK 2-3)
TS		SOIL BORING LOCATION (TASK 2-3)
TS W		EXISTING MONITORING WELL LOCATION (MF WESTON 1984)
IS		SOIL GAS PROBE LOCATION (TASK 2-3)
WW		PROPOSED MONITORING WELL
TS		PROPOSED SOIL BORING
WW		PROPOSED MULTILEVEL WELL CURTAIN



FENCE
NO. 1

FENCE
NO. 2

PARAMETER	MW-4	MW-4A	MW-9	MW-10A	MW-10B	MW-42
Alcohol (2-Ethylhexyl) phthalate	28	.	7	.	.	.
	.	.	6.1	.	.	.
	.	.	7	.	.	.
	.	.	7	.	.	.
Dissolved Oxygen	10.5	11.2	7.8	5.4	NA	10.6

PARAMETER	MW-11	MW-12	MW-13	MW-14	MW-112	MW-12
Methylene Chloride	.	1	.	7.3	.	.
Acetone	.	8	.	7	.	.
2-Butanone	.	40	.	7	53000	3
Chloroform	.	.	1	7	.	.
bis(2-Ethylhexyl) phthalate	.	4	.	.	9	6
Lead	.	6.3	.	.	.	.
TRPH	.	.	.	7	.	.
Dissolved Oxygen	NA	10.4	NA	NA	1	.

SE RUNWAY

0 400 800 FEET

EC JORDAN & C
CONSULTING ENGINEERS

INSTALLATION RESTORATION PROJECT
MASSACHUSETTS MILITARY RESERVE

MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

- ◆ **STUDY AREA FS-1** *(continued)*
 - ◇ Target Compound List (TCL)
groundwater contamination not detected at wells located adjacent to turnaround areas.
 - ◇ Comprehensive review of soil and water data necessary prior to determining future studies or actions.

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MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

- ◆ **STUDY AREA FS-2**
 - ◇ 1202 Groundwater study detected Fuel-related constituents in groundwater south of FS-2.
Header pipes near railroad transfer lines appear to be former source.

MARCH 21, 1990

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MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

- ◆ **STUDY AREA FS-2** *(continued)*
 - ◇ Degradation/Reaction of contaminants in aquifer appears to occur. No detection of TCL Organics above MCLs. Tentatively identified compounds (TICs) detected.

MARCH 21, 1990

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MASSACHUSETTS MILITARY RESERVATION
Summer 1989 Field Investigations

- ◆ **STUDY AREA FS-2** *(continued)*
 - ◇ Groundwater sampling program will be performed to characterize groundwater.

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MW-2	5/10/88	9/7/89
TCL VOCs		
CHLOROBENZENE	1 J	ND
TCL SVOCs	ND	ND
TPH	NA	NA
TCL LEAD	ND	ND
TICS	ND	ND

MW-4	5/10/88	9/7/89
TCL VOCs		
TCL SVOCs	ND	ND
TPH	NA	ND
TCL LEAD	ND	ND
TICS	ND	ND

MW-1306 (12/7/89)	82'-67"
TCL VOCs	ND
TCL SVOCs	NA
TPH	NA
TCL LEAD	NA
TICS	4(VOCs)

MW-2

MW-4

MW-1304

HEADER PIPELINE

MW-1311 (12/7/89)	82'-67"
TCL VOCs	ND
TCL SVOCs	NA
TPH	NA
TCL LEAD	NA
TICS	5(VOCs)

MW-1	5/10/88	9/7/89
TCL VOCs		
CHLOROBENZENE	8	ND
XYLENE	1 J	ND
TCL SVOCs		
1,2-DICHLOROBENZENE	8 J	ND
TPH	NA	ND
TCL LEAD	ND	ND
TICS	ND	ND

MW-1

MW-1306

MW-1311

MW-1305

MW-3	5/10/88	9/7/89
TCL VOCs	ND	ND
TCL SVOCs		
BIS(2-ETHYLHEXYL)PHTHALATE	4 J	ND
TPH	NA	ND
TCL LEAD	7.3	ND
TICS	ND	1(SVOC)

MW-1302

MW-1301

MW-1202

MW-1303

RFW-9 (MW-603D)	4/16/85	10/28/87	1/6/88	5/10/88	9/8/89
(WESTON)					
TCL VOCs					
ETHYLBENZENE	2 8	ND	ND	ND	ND
4-METHYL-2-PENTANONE	210	ND	ND	ND	ND
XYLENES	4 8	2 8 J	2 J	ND	ND
TCL SVOCs	NA	ND	ND	ND	ND
TPH	NA	NA	NA	NA	ND
TCL LEAD	NA	ND	ND	ND	ND
TICS	NA	ND	ND	ND	ND

MW-603E	10/28/87	1/6/88	5/10/88	9/8/89
TCL VOCs				
ETHYLBENZENE	ND	4 J	ND	ND
XYLENES	ND	7	ND	4
TCL SVOCs				
BIS(2-ETHYLHEXYL)PHTHALATE	ND	23	ND	ND
DI-N-BUTYLPHTHALATE	ND	82	ND	ND
TPH	NA	NA	NA	ND
TCL LEAD	ND	ND	ND	ND
TICS	ND	ND	ND	8(VOCs)

MW-1301 (11/30/89)	52'-57'
TCL VOCs	ND
ETHYLBENZENE	81
XYLENE	84
TCL SVOCs	NA
TPH	NA
TCL LEAD	NA
TICS	10(VOCs)

MW-1202C (11/17/89)	54'-59'	59'-64'
TCL VOCs	ND	ND
ETHYLBENZENE	91	1 X
XYLENE	230	4 X
TCL SVOCs	NA	NA
TPH	NA	NA
TCL LEAD	NA	NA
TICS	8(VOCs)	ND

RFW-8	4/16/85	9/8/89
(WESTON)		
TCL VOCs	ND	ND
TCL SVOCs	NA	ND
TPH	NA	ND
TCL LEAD	NA	ND
TICS	NA	ND

MASSACHUSETTS MILITARY RESERVATION

MW-1307

MW-1307 (12/8/89)	64'-69'
TCL VOCs	ND
TCL SVOCs	NA
TPH	NA
TCL LEAD	NA
TICS	4(VOCs)

BOUNDARY

KITTREDGE ROAD

MCLs

XYLENE 440 ppb (proposed)
ETHYLBENZENE 680 ppb (proposed)

MW-1308 (12/7/89)	89'-79'
TCL VOCs	ND
TCL SVOCs	NA
TPH	NA
TCL LEAD	NA
TICS	2(VOCs)

MW-1310

MW-1308

MW-1309

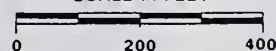
NOTES

- ND NOT DETECTED
- NA NOT ANALYZED
- J ESTIMATED CONCENTRATION
- X PRESENCE STRONGLY SUSPECTED
- TIC TENTATIVELY IDENTIFIED COMPOUNDS
- 1 ALL CONCENTRATIONS OF ORGANICS IN ug/L
- 2 ALL CONCENTRATIONS OF INORGANICS IN mg/L
- 3 ONLY THE NUMBERS AND TYPES OF TICS ARE INDICATED - NOT TIC CONCENTRATIONS

LEGEND

- BASE BOUNDARY
- ⊕ MONITORING WELL
- ⊙

SCALE IN FEET

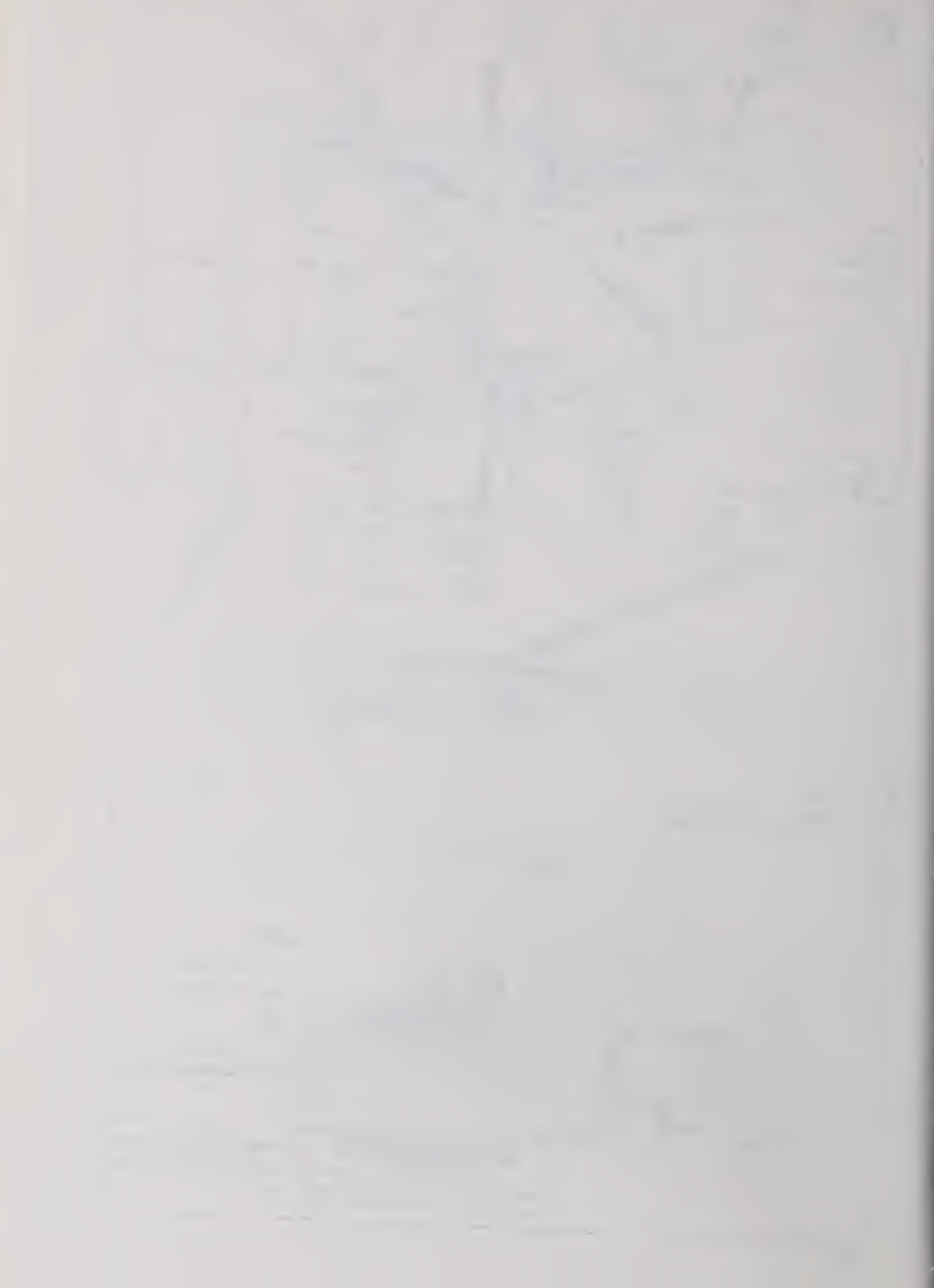


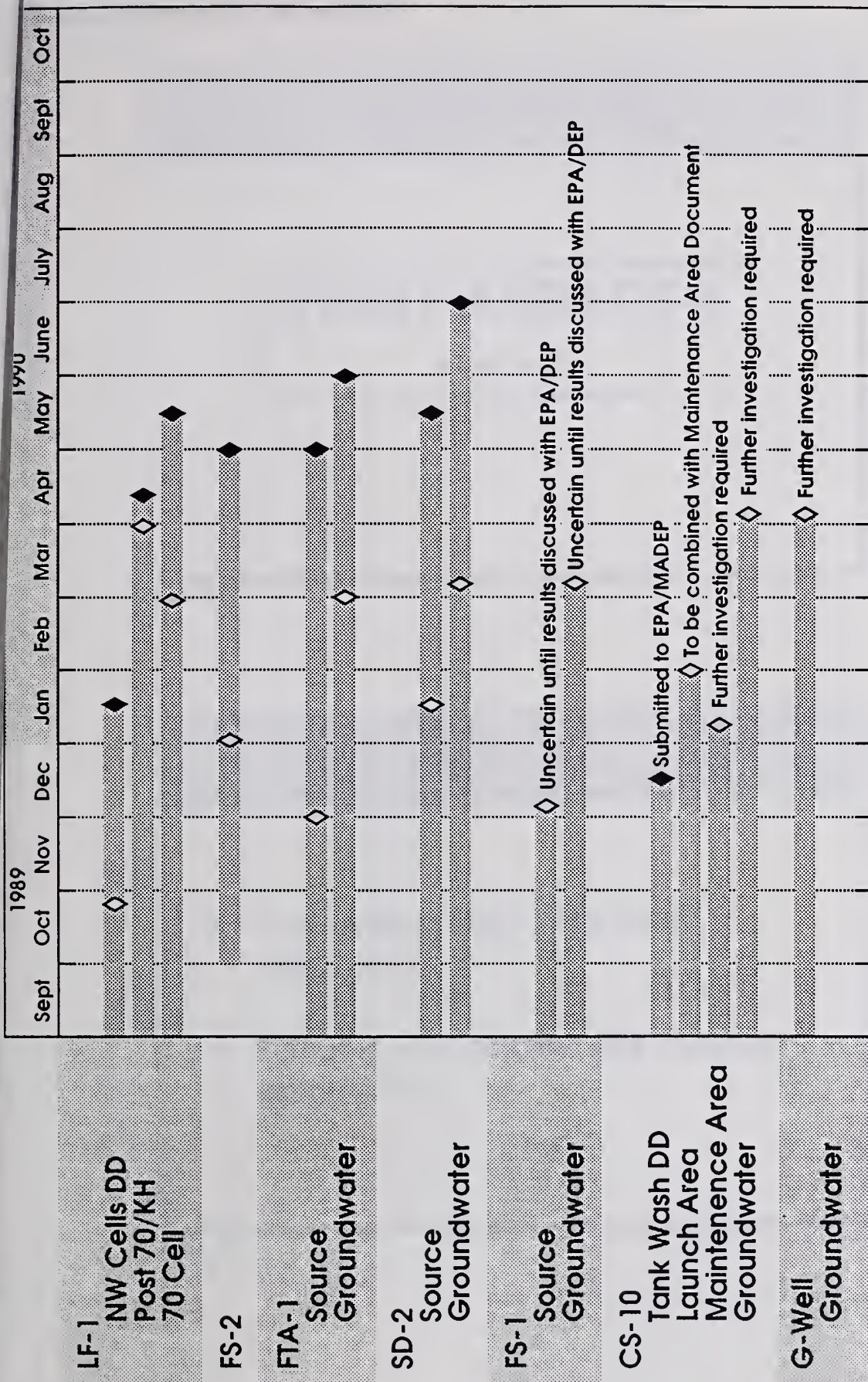
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INSTALLATION RESTORATION PROGRAM
MASSACHUSETTS MILITARY RESERVATION

FS-2
INTERPRETIVE GROUNDWATER
ANALYTICAL RESULTS

TASK 2-5





KEY

Date Scheduled for Draft Completion
(HAZWRAP Review)

◇ Original ◇ Current

FS COMPLETION SCHEDULE

MASSACHUSETTS MILITARY RESERVATION

STUDY AREA CS-4

PUMP TEST

MARCH 21, 1990

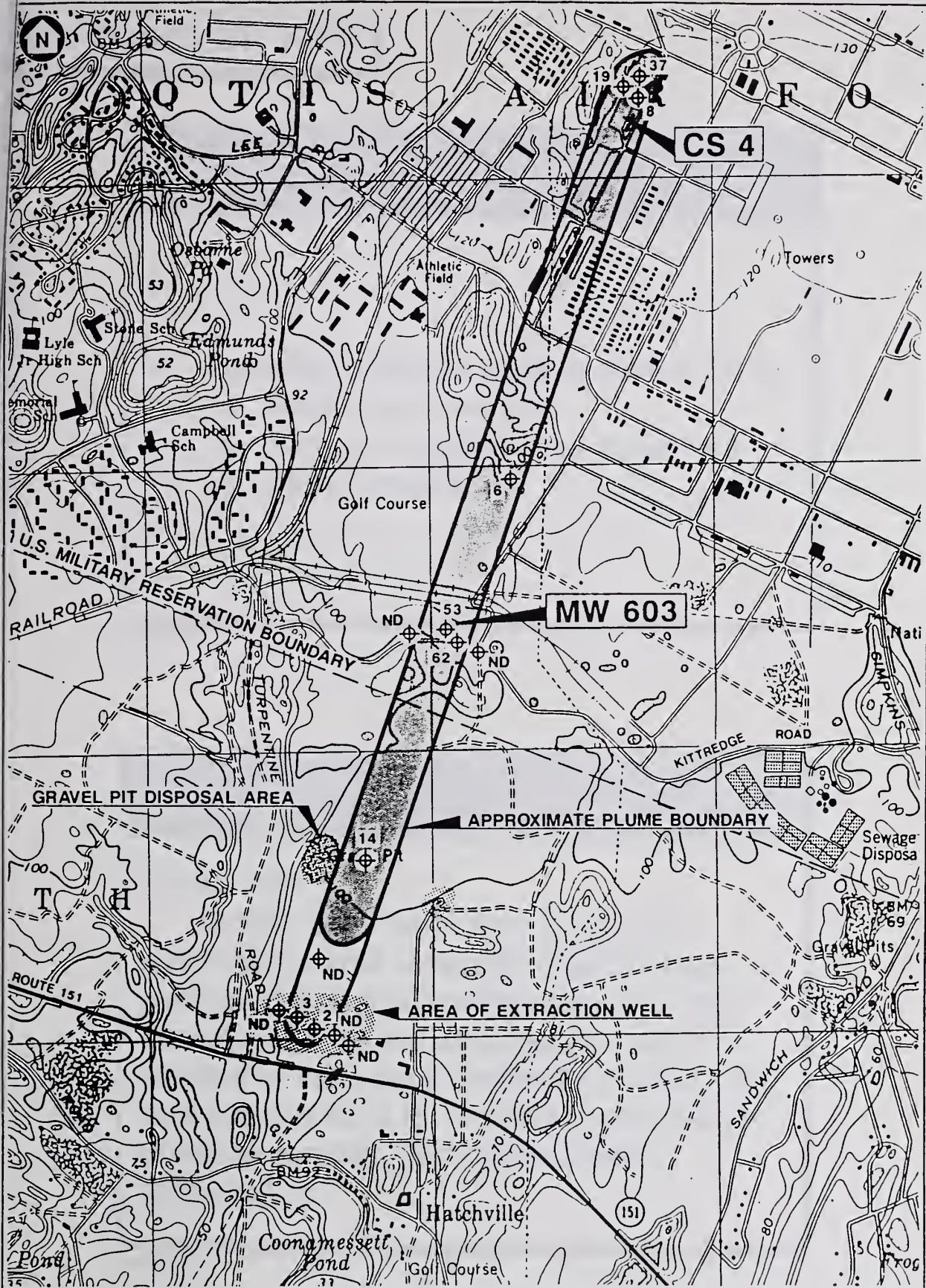
19

MASSACHUSETTS MILITARY RESERVATION
Study Area CS-4 Pump Test

- ◆ Observation wells installed In December.
- ◆ Pumping well installed late February / early March.

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LEGEND



TETRACHLOROETHENE (PCE)
($\mu\text{g/l}$)



ESTIMATED LOCATION OF
>5 $\mu\text{g/l}$ PCE CONCENTRATION

BASE MAP SOURCE: U.S.G.S MAPS
POCASSET, MASS. DATED 1967 (Photorevised 1979) &
FALMOUTH, MASS. DATED 1972 (Photorevised 1979)

SCALE IN FEET

0 1000 2000 3000

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INSTALLATION RESTORATION PROGRAM
MASSACHUSETTS MILITARY RESERVATION

PHASE II SITE PLAN
MW 603 STUDY AREA

FIGURE 1-2

MASSACHUSETTS MILITARY RESERVATION
Study Area CS-4 Pump Test

- ◆ Pump test initiated week of March 12-18.
 - ◇ Step Drawdown Test
 - ◇ 72-Hour Constant Rate Pump Test
 - ◇ USGS Tracer Study

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MASSACHUSETTS MILITARY RESERVATION
Study Area CS-4 Pump Test

OBJECTIVE:

Gather additional data to support evaluation of the feasibility of extracting contaminated groundwater from the CS-4 GW plume. The test will supply information relative to the aquifer hydraulic conductivity, and provide data for assessing effectiveness, implementability, and cost of plume remediation.

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MASSACHUSETTS MILITARY RESERVATION
Study Area CS-4 Pump Test

- ◆ **Pump test data assessment**
 - ◇ Evaluate Step-drawdown data in the field.
 - ◇ Review hydrogeologic data from pump test.
 - ◇ Assess potential impact of other areas of groundwater contamination on aquifer remediation (i.e., Study Area CS-10).
 - ◇ Develop plan for action on CS-4 plume by May TEAC.

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MASSACHUSETTS MILITARY RESERVATION

REMOVAL ACTION PLANS

STUDY AREAS SD-5 AND CS-10

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MASSACHUSETTS MILITARY RESERVATION
Removal Action Plans

- ◆ MMR Team pursuing removal actions at SD-5 dry well and three sumps / dry wells identified at CS-10.
- ◆ Technical Memorandum (EE/CA) justifying removal actions and describing scope of removal action is being prepared for regulatory review.

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MASSACHUSETTS MILITARY RESERVATION
Removal Action Plans

- ◆ Design effort proceeding concurrently with Technical Memorandum.
- ◆ Removal actions will be conducted in a manner consistent with revised National Contingency Plan (NCP) Sections 300.400 and 300.415 .

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MASSACHUSETTS MILITARY RESERVATION
Study Area CS-4 ~~MAF-103~~

- ◆ Final air modeling work being completed.
- ◆ Air modeling results being incorporated in final FS report.
- ◆ Development of proposed plan forthcoming.

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MASSACHUSETTS MILITARY RESERVATION

***BASE LANDFILL CLOSURE
PROGRAMS***

STUDY AREA LF-1

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MASSACHUSETTS MILITARY RESERVATION
Base Landfill Closure Programs

- ◆ 6 Separate Cells
- ◆ 3 Operable Units
 - ◇ Northwest Operable Unit Cells (1947 1951, 1957 cells)
 - ◇ 1970 Cell Operable Unit
 - ◇ Post-1970 and Kettle Hole Operable Unit

MARCH 21, 1990

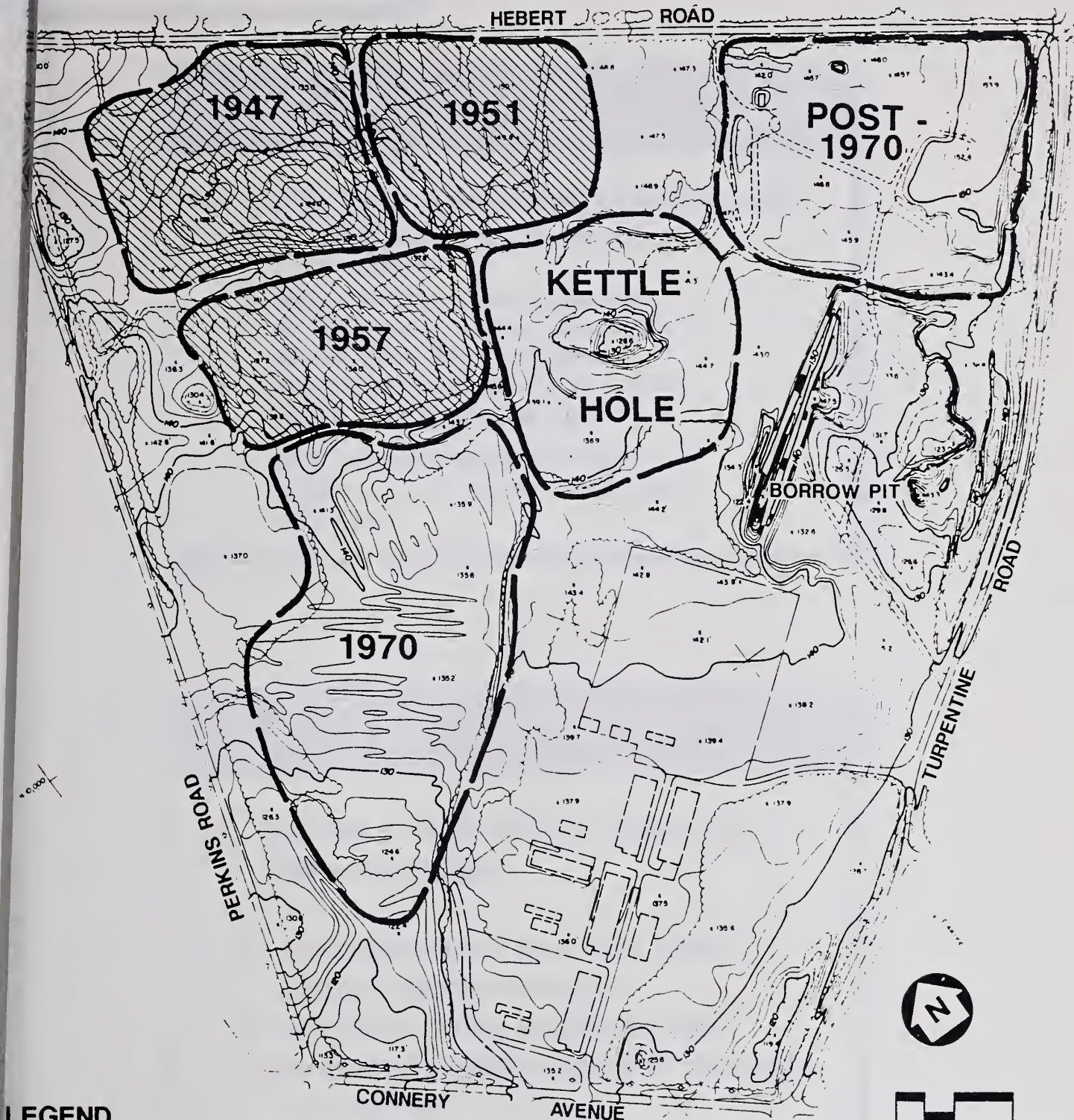
29

MASSACHUSETTS MILITARY RESERVATION
Base Landfill Closure Programs

- ◆ Northwest Operable Unit Cells.
 - ◇ Environmental Justification Report undergoing internal review.
 - ◇ No further action recommended based on monitoring well data near cells.
 - ◇ ANG proposed long-term groundwater monitoring program based on MADEP post-closure regulations.

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LEGEND

- CELL BOUNDARY (INTERPRETED FROM HISTORIC PHOTOGRAPHS)
- CONTOUR ELEVATION (ABOVE MSL)
CONTOUR INTERVAL: 2 FEET

LOCATIONS OF FORMER STRUCTURES OF PRIORITY 2 SITE CS-9 (USAF MOTOR POOL)

NOU CELLS

EC JORDAN CO. CONSULTING ENGINEERS		LF-1 BASE LANDFILL PHOTOGRAMMETRIC MAP SHOWING DISPOSAL CELLS ENVIRON. JUSTIFICATION REPORT	
INSTALLATION RESTORATION PROGRAM MASSACHUSETTS MILITARY RESERVATION		LF-1 SITE	FIGURE 2-1

MASSACHUSETTS MILITARY RESERVATION
Base Landfill Closure Programs

- ◆ **Post -1970 / Kettle Hole operable unit.**
 - ◇ Closure design report being prepared by MMR team.
 - ◇ ANG proposes to cap these cells in a manner consistent with current MADEP solid waste regulations provided to MMR team in July 1989.
- ◆ **1970 Cell Operable Unit.**
 - ◇ MMR team reviewing well data to determine appropriate cell closure measures.

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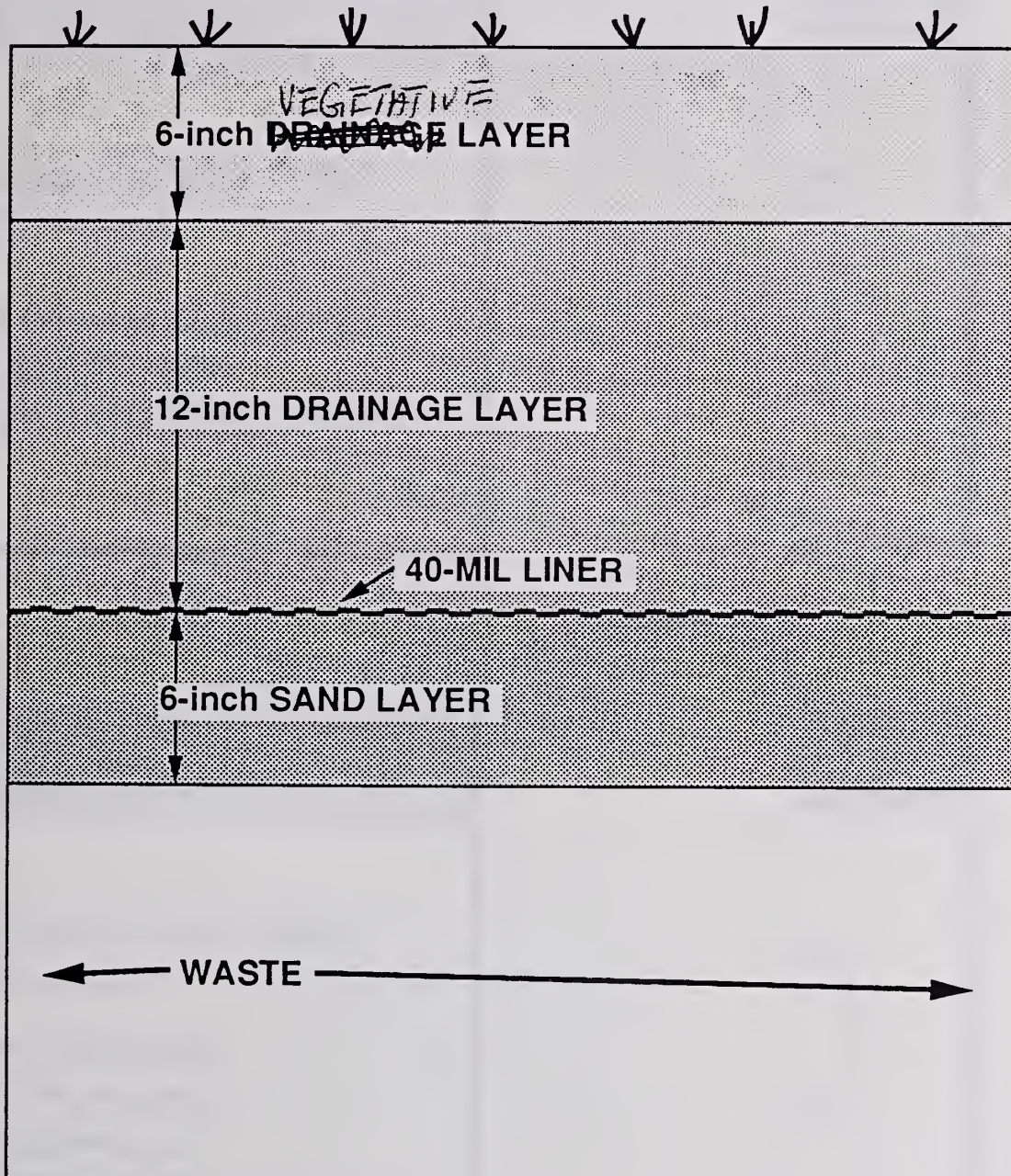
MASSACHUSETTS MILITARY RESERVATION
Base Landfill Closure Programs

- ◆ **Closure design report for Post-1970 / Kettle Hole Cells.**
 - ◇ Conceptual site plan and cover system design drawings.
 - ◇ Proposed cover system layout.
 - ◇ Proposed grading plan with drainage evaluation.

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5% MINIMUM SLOPE



MADEP GUIDANCE
LANDFILL CAP DESIGN

Date	Description	Particulars	Debit	Credit
1891				
Jan 1	Balance			100.00
Jan 10	By Cash		50.00	
Jan 20	To Cash			25.00
Jan 30	By Cash		75.00	
Feb 10	To Cash			100.00
Feb 20	By Cash		150.00	
Feb 30	To Cash			50.00
Mar 10	By Cash		200.00	
Mar 20	To Cash			75.00
Mar 30	By Cash		125.00	
Apr 10	To Cash			100.00
Apr 20	By Cash		175.00	
Apr 30	To Cash			50.00
May 10	By Cash		225.00	
May 20	To Cash			100.00
May 30	By Cash		125.00	
Jun 10	To Cash			150.00
Jun 20	By Cash		200.00	
Jun 30	To Cash			75.00
Jul 10	By Cash		250.00	
Jul 20	To Cash			100.00
Jul 30	By Cash		125.00	
Aug 10	To Cash			175.00
Aug 20	By Cash		225.00	
Aug 30	To Cash			100.00
Sep 10	By Cash		275.00	
Sep 20	To Cash			150.00
Sep 30	By Cash		125.00	
Oct 10	To Cash			200.00
Oct 20	By Cash		250.00	
Oct 30	To Cash			75.00
Nov 10	By Cash		300.00	
Nov 20	To Cash			150.00
Nov 30	By Cash		125.00	
Dec 10	To Cash			225.00
Dec 20	By Cash		275.00	
Dec 30	To Cash			100.00
Total			3000.00	3000.00

USETTS MILITARY RESERVATION
Landfill Closure Programs

design report for Post-1970 /
Ice Cells *(continued)*

cnical analysis of settlement
over system integrity.
equal gas management system.

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ATION

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USETTS MILITARY RESERVATION
Feasibility Studies

design report for Post-1970 /
Ice Cells *(continued)*

el support structures
ary and Permanent)
ure requirements
eance / Monitoring programs)

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ATION

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MASSACHUSETTS MILITARY RESERVATION
Accomplishments Since Last TEAC (1/17/90)

<u>Date</u>	<u>Title</u>	<u>Status</u>
23 February	Site Inspection Report Addendum, Results of Additional SI Sampling Conducted Summer 1989, Task 2-3C	HAZWRAP Review
27 February	No Further Action Decision Document for Site FS-20, Current Product Tank No. 88	ANG / Regulatory Signatures
27 February	No Further Action Decision Document Site CS-10 Tank Wash Operable Unit	ANG / Regulatory Signatures
28 February	Remedial Investigation Field Sampling and Analysis Plan, Six Priority 1 Sites, Task 2-5	TEAC Review

MARCH 21, 1990

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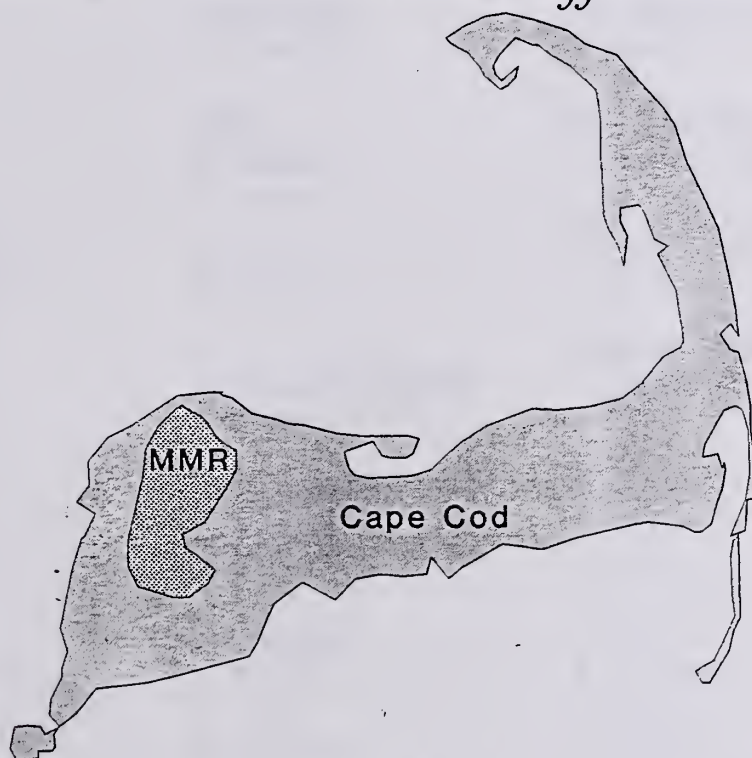
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Meeting Summary

54th Meeting of

TEAC

(Technical Environmental Affairs Committee)



*Installation Restoration Program
Massachusetts Military Reservation
Cape Cod*

March 22, 1995

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Meeting Minutes
54th Meeting of the Technical Environmental Affairs Committee
Massachusetts Military Reservation, Cape Cod

Meeting Date: Wednesday, March 22, 1995
Location: Arnold Hall, Otis ANG Base

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Rep. Cahir's Office

T. Cahir

Rep. Turkington's Office

E. Turkington

Other

K. Buchi
V. Carter
E. Foster
C. Hollister
L. House
S. Nickerson
G. Taylor
J. Watson
Bourne Selectmen's Office
Main Libraries of Falmouth,
Mashpee, Sandwich, Bourne,
and the on-base USCG Library

MEETING MINUTES

Technical Environmental Affairs Committee Otis Air National Guard Base, Massachusetts

March 22, 1995
9:20 A.M.

<u>Members:</u>	<u>Organization:</u>	<u>Telephone No.</u>
Lt. Col. Michael Washeleski	ANGRC/CEV	(301) 981-8144
Jim Begley	MADEP	(508) 946-2871
Tom Cambareri	Cape Cod Commission	(508) 362-3828
Keith Smith	Coonamessett Pond Association	(508) 564-4112
Elias McQuaid	Town of Mashpee	(508) 539-1418
JoAnne Miller Buntich	Town of Sandwich	(508) 833-8001
George Seaver	LF-1 Committee	(508) 564-4404
Col. Bill Labrie	The Adjutant General	(617) 944-0500
Paul Marchessault	USEPA	(617) 573-5793

<u>Nonmembers:</u>	<u>Organization:</u>	<u>Telephone No.</u>
Michael Minior	ANGRC/CEVRO	(508) 968-4670
Douglas Karson	ANGRC/CEVRO	(508) 968-4678
Ed Pesce	ANGRC/CEVRO	(508) 968-4670
Marty Aker	ANGRC/CEVRO	(508) 968-4971
Ken Till	OpTech Otis	(508) 457-6012
Lorie Baker-Wallace	OpTech Oak Ridge	(615) 483-8020
Troy Clarkson	OpTech Otis	(508) 457-6012
D. John Lee	Aneptek	(508) 650-1048
Walter Zorn	HAZWRAP	(615) 435-3493
Sheila Warren	Maher Environmental	(617) 933-3210
David Jacobsen	Camp Edwards Env. Office	(508) 968-5834
Julia Nault	CDM Federal	(617) 742-2659
Cliff Bell	CH2MHill	(201) 316-9300
Charles Jacobs	Coonamessett Pond Assoc.	(508) 564-4112
Mea Kinnon	HAZWRAP	(615) 435-3626
Henry Cui	MADEP	(508) 946-2889
Shaun Cody	MAARNG	(617) 944-0500

Nonmembers:

Dick Prince
 JoAnn Watson
 Kathleen Buchi
 Susan Nickerson
 Marcel Boelitz
 Greg Taylor
 Nancy Caffyn
 Rick LaPointe
 Frank Morrissey
 Chet Majewski
 Barret Borry
 David Borowy
 Don Hudson
 Chuck Rossoll
 Binks Colby-George
 Paul Farrington
 Eileen Gunn
 Pat deGroot
 Mike Plumb
 Andrew Koenigsberg
 Jonathan Bridge
 David Quagliaroli
 Lt. Col. Paul Brogna
 Paul Sullivan
 William Kerfoot
 Col. Don Quenneville
 Rick Klozmark
 Linda Marler
 Robert Stavrakas
 Eric Dexter
 John Scott
 Bill Sullivan
 W. Jesse Schwalbaum
 Ken Gayner
 Don Gardner
 Laura Dignam
 William Davidson
 Mark Haley
 Thomas Bourne
 Col. Harry Mehrmann
 Greg Taylor
 Marcel Boelitz

Organization:

Cape Cod Commission
 National Guard Bureau
 US Army Environmental Center
 APCC
 MADEP
 Town of Mashpee
 Town of Mashpee
 Private Citizen

 Metcalf & Eddy
 USACHPPM
 Groundwater Technology
 ASI
 ABB-ES
 ABB-ES
 Groundwater Technology
 Coalition for Buzzards Bay
 SAIC
 Aneptek Corp.
 Aneptek Corp.
 GeoTrans, Inc.
 East Coast Thomas Environmental
 102 FW/DE
 ANG
 KV Associates
 102 FW/CC
 GeoInsight, Inc.
 GeoInsight, Inc.
 Country Farms Estate
 MADEP
 Foster Wheeler Environmental
 102 FW/ESO
 Whitman & Howard, Inc.
 HydroGroup
 Coast & Harbor
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 HQ Camp Edwards/CC
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The 54th meeting of the Technical Environmental Affairs Committee (TEAC) was convened by Mr. Douglas Karson at 9:20 a.m. Mr. Karson stated that there are six formal agenda items for today's meeting including a posterboard session by ABB-ES on "Lake Influence on Deep Plume Migration" to be held during the break. Mr. Karson stated that, at the break, he would also be showing a video on recent field activities.

Mr. Karson asked if there were any comments to the minutes from the 53rd meeting of the TEAC held on January 18, 1995. Being none, Mr. Karson stated that the minutes would stand as written.

Mr. Karson noted that there would be a meeting of the Senior Management Board on March 23, 7 p.m., in Arnold Dining Hall, Otis ANG Base. He added that the agenda for that meeting was available on the table at the entrance to the Dining Hall. He stated that the agenda included a discussion of rules and guidelines for the Senior Management Board, future public participation activities, status of contracts, and other business that comes before the Board.

Mr. Karson asked that everyone in attendance at today's meeting introduce themselves.

Mr. Karson stated that he had two discussion items prior to beginning formal agenda. Regarding the frequency of TEAC meetings, Mr. Karson noted that at the previous TEAC meeting it had been decided to maintain the current schedule of every other month. However, he suggested the possibility of holding a number of the future meetings at night, noting that the TEAC is a good forum for providing information to the public and that a more diverse audience might be in attendance if the meetings were held in the evening. He also suggested the possibility of having some or all the meetings off-base. He proposed that the evening meetings commence at 5 p.m. with the intent of running for three hours.

Ms. JoAnne Miller Buntich suggested that the meetings be alternated between day and evening and approved of having the meetings off-base. Mr. Keith Smith stated that 5 or 6 p.m. were awkward times for meetings and proposed that the meetings be convened at 7 p.m. Lt. Col. Michael Washeleski expressed his concern that if the meetings did not start until 7 p.m., and ran their historical length of four hours or more, they might not adjourn until almost midnight. Mr. Walter Fagnant supported Ms. Buntich's recommendation to alternate the meetings between the morning and evening and hold a number of the meetings off-base. Mr. Karson proposed that the meetings rotate between the towns and the base and alternate between morning and evening meetings. He stated that it would be possible to work out the time constraints. After some additional comment, Mr. Karson proposed that the next TEAC meeting be held at the Morse Pond School in Falmouth at 7 p.m. Mr. Rick LaPointe agreed that the proposal to hold the meetings in the evening presents an opportunity for increased public participation. However, he suggested that Arnold Dining Hall would be a more central location for citizens of the four surrounding communities. Mr. Begley agreed that the number of meeting locations should be limited. Ms. Valiela suggested that the first meeting be held in Falmouth, as discussed, to determine how many residents from the surrounding communities attend and that this change be done on a "trial basis". Mr. Karson stated that he would reserve the Morse Pond School for the

next meeting of the TEAC. Mr. LaPointe suggested that the morning meeting be held at Arnold Dining Hall. Mr. Karson asked the TEAC members if they were in agreement that the next TEAC meeting be held in the evening at the Morse Pond School in Falmouth. There was no dissension.

Mr. Karson proceeded to discuss the Proposed Plan for No Further Action at USCG Chemical Spill 1 (CS-1). Mr. Karson noted that a 30 day public comment period, public meeting and hearing are required and that the normal procedure would be to have the meeting the day before the start of the comment period and the hearing two to three weeks into the comment period. However, due to the nature of the document and the site, Mr. Karson proposed that both the public meeting and the public hearing be held at the same time to save manpower resources. Mr. Karson stated that the formal public comment period would run from April 11 to May 10 and he proposed that the public meeting and public hearing be held off-base on the evening of May 3. Mr. Paul Marchessault stated that the U.S. Environmental Protection Agency (EPA) concurs with this suggestion and noted that the Navy has proceeded in this manner for years. Mr. Karson stated that if no opposition is received, the National Guard Bureau (NGB) will schedule the public meeting and the public hearing on May 3.

Mr. Karson proceeded to introduce Mr. Minior for a discussion of the first formal agenda item, Plume Response Plan design contract activities.

Plume Response Plan Design Contract Activities, Mr. Michael Minior, NGB

Mr. Minior stated that the kickoff meeting with Operational Technologies Corp. (OpTech) for the design contract for the containment of the seven plumes as outlined in the Plume Response Plan was held on March 14. He stated that their draft schedule was due to the NGB next week and that the NGB would review this and request any necessary adjustments. He added that the schedule would be released to the public after it is finalized. Mr. Minior stated that the meeting with OpTech was successful and that OpTech had a clear understanding of the contract requirements. Mr. Minior noted that the NGB's project management firm, CH2MHill, would work to preclude any problems associated with coordination and that there is a commitment from all parties, including the EPA and the Massachusetts Department of Environmental Protection (DEP), who were present at the kickoff meeting, to work together towards the common objective of plume containment. Ms. Valiela asked if OpTech had designated their subcontractors. Mr. Minior stated that they had not. However, he noted that this is a \$4.1 million contract and that OpTech is working towards finalizing its design team. Ms. Valiela requested that this information be made available to the TEAC when finalized. Mr. Minior stated that it would be.

Mr. George Seaver asked what has happened to well replacement for Bourne Water District wells Numbers 2 and 5. He also asked if the flow regime in this area has been characterized as to whether it is single or double flow. Mr. Minior replied that the first item for OpTech under their design contract is to characterize the groundwater flow in the aquifer. He added that the technical paper developed by Dr. Curtis would be given to OpTech. He noted that a well replacement contract with Stone & Webster would be negotiated by telephone within a week.

Mr. Seaver stated that he had learned that there had been some difficulty with the potential replacement sites. Mr. Minior replied that he had not ascertained that, but noted that the Bourne Water District had installed some test wells and that there had been some concerns regarding water quality from one of those wells. Mr. Seaver stated that oil had been found in that well. Mr. Begley added that the location where the Bourne Water District well was installed was just off-base and that a fuel odor was encountered. However, Mr. Begley added that the screening results only indicated toluene at four parts per million (ppm). He did express a concern as to what the potential source could be. Mr. Seaver asked that he be brought into any discussions evaluating the flow regime of the aquifer in the vicinity of the LF-1 plume. Mr. Minior agreed to do this.

Regarding the design contract, Mr. LaPointe asked exactly who OpTech is and if they have the background to execute this design project. Mr. Minior stated that OpTech is headquartered in San Antonio, Texas and that they are a small firm with a growing reputation for excellent work and that they are forming a team of professionals comprised of companies and individuals with prior knowledge of the Installation Restoration Program (IRP) at the Massachusetts Military Reservation (MMR). Mr. LaPointe asked if the public could receive the resumes of the specific individuals comprising the design team. Mr. Minior stated that the resumes would be distributed when received. Mr. Karson stated that he would be generating fact sheets specifically related to the design effort for distribution to the site mailing list.

Mr. Karson introduced Mr. Cliff Bell for a discussion of the Plume Response Plan Management Plan activities.

Plume Response Plan Management Plan Activities, Mr. Cliff Bell, CH2MHill

Mr. Bell proceeded to share highlights of the kickoff meeting. He stated that the kickoff meeting served as a forum for all the major players, the NGB, OpTech, CH2MHill, EPA, and the DEP, to introduce themselves and to exchange ideas and strategies to ensure the success of the design. He added that a formal public kickoff meeting will be held to solicit feedback from the public. Regarding project logistics, Mr. Bell stated that OpTech will be required to follow the Project Management Plan developed by CH2MHill which allows for communication through open channels while recognizing the need for formal procedures on decisions that impact the development of the design. He noted that weekly progress meetings would be held with the NGB, OpTech, and CH2MHill. Mr. Bell stated that issues that impact the schedule, including review periods, were discussed. He noted that the EPA has agreed to a one week review period for the Work Plan and a couple of weeks for other formal deliverables. He stated that Mr. Minior had indicated that he could ensure a timely NGB and peer review by the EPA's Kerr Laboratory. He reiterated Mr. Minior's statement that OpTech would be providing a design schedule to incorporate into the master schedule being developed by CH2MHill.

Mr. Bell indicated that concurrency would be crucial to maintaining the design schedule. He added that technical status update meetings would be critical for review by team members prior to their formal review obligations to ensure an expedited approval. Mr. Bell stated that

innovative methods, including videoconferencing, would be used to assist in maintaining a high level of involvement by all parties.

Mr. Bell stated that there would be two phases to the containment implementation that would be impacted by property access issues. He noted that these would be the effort to fill data gaps during the design field program and the actual installation of the extraction and reinjection well fences.

Mr. Bell stated that the next update would be presented at the formal public remedial design kickoff meeting to be held in April.

Mr. LaPointe asked if there would be any releases to the public from CH2MHill or if the information would be disseminated by the NGB. Mr. Bell stated that this would be the responsibility of the NGB. A member of the audience asked if the technical status update meetings would be open to the public. Mr. Bell stated that he envisions the weekly meetings with the NGB and OpTech to be closed door sessions to address specific issues. Mr. Karson noted that there are up to six meetings in OpTech's contract to provide information in a public forum. He stated that his office also intends to present a great deal of information as the process progresses and has recently initiated a series of fact sheets specifically dealing with the design project.

Mr. Marchessault noted that the Kerr Laboratory, located in Ada, Oklahoma, is an EPA laboratory and has extensive experience in projects of this magnitude.

Mr. Tom Cambareri expressed his concern that the containment program is diverting the attention of the IRP staff from other important projects. He stated that it would be necessary to develop trust and confidence in CH2MHill and their ability to manage the day-to-day operations, thus alleviating some of the pressure from the IRP staff. Mr. Cambareri asked if there was any plan to increase the internal IRP staff. Mr. Minior replied that the NGB is evaluating several alternatives to supplement his staff. He stated that he has positions that he would like to fill, including several environmental engineers and a public affairs specialist. He noted that in the interim he has access to staff at the Air National Guard Readiness Center (ANGRC) to supplement his staff. He added that the overall program is being executed as planned. Mr. Cambareri asked if there was anything the TEAC could do to assist in ensuring that these positions are filled. Mr. Minior replied that his comments have been acknowledged and that the ANGRC supports an increase in the local staff. However, he noted that there has been talk of a hiring freeze due to cuts in the Defense Environmental Restoration Account (DERA) program. He mentioned that he has had conversations with the Army National Guard regarding the possibility of hiring support personnel.

A member of the audience asked for an update on the status of the proposed combined containment project for the Fuel Spill (FS)-12 and J. Braden Thompson plumes. Mr. Begley stated that the DEP had developed a conceptual plan to examine the possibility of using one treatment facility for both plumes. He noted that the conceptual plan indicated that little time

would be saved towards containment of the FS-12 plume and that it would actual result in a significant delay in containing the J. Braden Thompson plume. Mr. Begley stated that on the basis of this analysis the DEP is proceeding with the containment of the J. Braden Thompson plume exclusive of the FS-12 plume.

Mr. Karson noted that at the end of today's handout is the proposed agenda for the May meeting of the TEAC. He asked the TEAC members review this and be prepared to discuss it at the conclusion of today's meeting. Ms. Valiela suggested that Item 7 become Item 1. Mr. Karson agreed to this order change.

Mr. Karson proceeded to introduce Mr. Marty Aker to present an update on basewide ethylene dibromide (EDB) studies.

Basewide Ethylene Dibromide Update, Mr. Marty Aker, NGB

Mr. Aker noted that EDB has been found in groundwater near the leading edge of the Chemical Spill (CS)-4 plume. He stated that wells in the Crane Wildlife Management Area would be resampled and that up to ten new wells would be installed in an attempt to delineate the extent of EDB in this area. He added that the Barnstable County Health Department is under contract to perform the analysis on samples collected from these wells. Mr. Aker stated that the contract for the installation of the new wells is being negotiated and the contractor should be in the field by mid-May. He stated that HAZWRAP has been tasked with providing a basewide map indicating the extent of EDB contamination and identifying potential source areas. Mr. Aker stated that private well testing was conducted along Boxberry Road in Hatchville on March 14 as a precaution. He stated that results from this sampling should be available by March 28. Mr. Aker noted that the EDB was encountered at 150 feet below ground surface (bgs) and that the level of contamination appears to be increasing with depth. Mr. Seaver asked what the maximum concentration encountered thus far is. Mr. Aker replied that it is 0.078 parts per billion (ppb), noting that the Maximum Contaminant Level (MCL) for EDB is 0.02 ppb.

Mr. Seaver proposed the use of a particle tracking method, such as MODFLOW, to determine the location of the source area. Mr. Aker stated that this is exactly what the NGB intends to do. Mr. Charles Jacobs asked what the vertical extent of the EDB is and its shallowest depth. Mr. Aker stated that contamination was found from 150 feet to 250 feet bgs. Mr. Jacobs asked what the southernmost extent of the contamination is. Mr. Aker stated that the leading edge has not been defined, but will be determined in the field program to commence in May. Mr. Seaver asked if bedrock was encountered at 255 feet bgs. Mr. Aker stated that bedrock is probably at 325 feet bgs. Mr. Aker discussed several possible methods and equipment that could be used to delineate the extent of vertical contamination. Mr. Jesse Schwalbaum asked what geology had been encountered. Mr. Aker stated that silty clay was found at 230 feet and that it is intended to use gamma logging as part of the field investigation. A brief discussion of appropriate field methods ensued. Mr. LaPointe expressed his concern that air rotary drilling could release EDB to the atmosphere. Mr. Aker assured Mr. LaPointe that his concerns would be relayed to the contractor. Mr. LaPointe stated that millions of gallons of aviation gasoline were released at

FS-1 and asked if EDB was tested for at this site. Mr. Aker stated that HAZWRAP would be providing a basewide EDB map.

Ms. Valiela asked how the regulators can keep track of all the projects in the future so that this apparent lapse does not occur again. Mr. Marchessault admitted that the project "slipped through the crack", but stated that the EPA did not "back burner" it. He stated that the report was not a deliverable under the Federal Facility Agreement (FFA) and that the NGB was now proceeding as quickly as possible. Mr. Begley stated that the regulators and the NGB are discussing ways to track specific projects and that they would be receiving status reports on on-going investigations. Mr. Minior agreed that some changes need to be made to make the process run smoother and that a status report would help meet this objective. Mr. LaPointe stated that EDB is the single most carcinogenic substance at the MMR and reiterated his concern that drilling holes results in focal points for the possible release of EDB to the atmosphere. Ms. Valiela stated that her goal is to protect public health and asked for information on how dangerous it is in the air. Mr. LaPointe pointed out that if the aviation gas is burned the danger from EDB is minuscule. However, he suggested that the EDB contamination has separated, concentrated, and settled in "huge" concentrations resulting in tremendous amounts potentially being released at once. Mr. Minior stated that the levels encountered are just over regulatory concentrations and that it will not be escaping into the air. He stated that the safety of the site workers is of utmost importance and suggested that Mr. LaPointe is "blowing [this problem] out of proportion". He added that the necessary safeguards will be in place. Mr. Cambareri asked if the exploratory wells would be sealed after the project is complete. Mr. Aker stated that the wells are sealed with bentonite and grout and locked with covers. Ms. Sheila Warren, who works for D.L. Mahre a drilling company that does work for the NGB, added that the Barber type rigs are completely enclosed and that vapors are not blown everywhere, but are filtered prior to being released to the atmosphere. Mr. Marty Aker proceeded to discuss on-going investigative actions.

Investigative Actions Update, Mr. Marty Aker, NGB

Mr. Aker stated that a basewide monitoring and sampling program has been instituted primarily addressing the Landfill (LF)-1, CS-10, CS-4, Ashumet Valley, and FS-12 plumes with sampling at the leading edges and along the axes of the plumes. Mr. Aker stated that 375 wells would be involved in the program and that the first sampling event occurred in December 1994. He noted that the report for this round of sampling was given to Lorie Baker-Wallace with OpTech to assist with the design project and that it is also available for public review. He stated that the next sampling event would occur at this end of this month and the program is scheduled for five years. Mr. Aker added that a database is being set up to track the results from each well to monitor the status of the leading edges, track the plumes, and generate more accurate maps. Mr. Seaver asked what has been done related to the determination of background concentrations. Mr. Aker stated that this has been addressed and that background data was generated as part of the CS-18/19 investigations. Mr. Minior noted that as part of the consolidation of all monitoring data his office is working with the Army on an MMR-wide database.

Regarding the MMR test well installation project, Mr. Aker stated that the NGB will be investigating sites for the replacement of Bourne Water District wells Nos. 2 and 5. He stated that this project would also ascertain water quality and quantity for the four towns surrounding the MMR. He stated that this project consists of installing ten pairs of two inch test wells and performing pumping tests on these wells, followed by the installation of eight inch wells at sites considered appropriate based on the results from the two inch well program. He stated that pump tests would also be performed on the eight inch wells. Mr. Aker stated Stone & Webster's contract to perform this work will be negotiated in March and that field work is expected to commence in the spring of 1995. Mr. Seaver asked Mr. Aker how firm the start date of spring 1995 is. Mr. Aker stated that, after the contract is negotiated, Stone & Webster would be required to develop and submit a Work Plan with a 30 day review period. He stated that mid-May would be a best case scenario for entering the field. Mr. Seaver asked if this would be dependent on the results from the CS-19 investigation. Mr. Aker replied that it would not. Mr. Seaver stated that he would not like to see the placement of an eight inch test well in the vicinity of CS-19. Mr. Aker agreed. Ms. Valiela asked that the location of CS-19 be indicated on the map. Mr. Aker indicated the location of CS-19 within the impact area. Ms. Valiela asked if there are any potential source areas upgradient from the Bourne Water District wells other than the MMR. Mr. Aker replied only some amphibious activities around the pond. Mr. Begley stated that the Bourne exploratory wells were approximately 100 feet downgradient from the base boundary. Ms. Valiela asked if the Bourne landfill may have had some impact on these wells. Mr. Aker responded that the Bourne landfill is considerably south of the location that the Bourne Water District installed their exploratory wells.

Mr. Aker stated that a Supplemental Site Inspection is being conducted at FS-7, the site of a reported leak in a 550 gallon underground storage tank (UST) located downgradient of FS-13. He stated that six soil samples were collected and no contamination was detected. He stated that a second monitoring well is being installed, but noted that the site appears to be clean.

Mr. Aker stated that the FS-13 Site Inspection involves a section of the pipeline located near the main rotary on the MMR. He stated that this is the same pipeline as at FS-12. He stated that 350 linear feet of pipeline had been trenched and, although rusty, appeared to be in good condition with no evidence of leaks. He stated that the project is programmed to trench another 500 linear feet of pipe. However, he stated that the equipment had been vandalized over the weekend which would result in some delay. Mr. Seaver asked for clarification that this pipeline was the same one that resulted in the FS-12 source area and plume. Mr. Aker responded affirmatively. Mr. Seaver asked if funding had been obtained to investigate the pipeline on the MMR. Mr. Aker stated only for the FS-13 portion. Mr. LaPointe asked what has happened regarding the request to the owner of the pipeline. Mr. Minior replied that notification had been made to the owner, but that there has been no response. He stated that the NGB has had discussion with the regulators regarding potential actions and that they have a "game plan" in place and have requested funding to implement a project to determine the integrity of the pipeline. However, Mr. Minior stated at this time no funding source has been identified. Mr. LaPointe suggested that money being used for the cleanup could be used to investigate the pipeline. Mr. Minior responded that this year's programmed funding is in place which does not

include funding for the pipeline and that obtaining outyear funding to investigate the pipeline is part of the process and will be done. Responding to a question from Mr. Seaver, Mr. Minor stated that the pipeline carried both aviation gasoline (AVGAS) and jet fuel over its serviceable lifetime. Mr. Seaver asked if this could be the potential source of the EDB discovered just downgradient from the leading edge of the CS-4 plume. Mr. Aker stated that this was one possibility and that he is anxious for the reverse particle tracking model to be executed. Mr. Aker noted that to this point the investigations at FS-13 have not indicated any leaks based on soil samples and field screening at the pipeline welds. He stated that a full analysis would be conducted, including the installation of three monitoring wells with groundwater sampling.

Mr. Aker proceeded to discuss the FS-14 Site Inspection. He stated that this is an Army Guard site north of the impact area where training maneuvers have been held and where a leak occurred in an 800 gallon tank. Mr. Aker stated that at the time of the leak soil was excavated to a depth of fifteen feet, field screened (tested) to 50 ppm. He stated that this was a motor gasoline (MOGAS) spill. As part of the site inspection, four monitoring wells were installed, one upgradient, one at the source area, and two downgradient. Mr. Aker stated that the field screening did not indicate the presence of contamination, but added that they are awaiting fixed-base laboratory analysis results. He noted that these results are expected in April. Mr. Seaver stated that previous practices on the MMIR have led to universal contamination of the southern slope of the Sagamore Lens and there is an assumption that the northern slope is pristine. He added that it now appears that the northern slope is not uncontaminated and that one of the highest priorities for the IRP office should be further investigations in this area including CS-18 and CS-19. Mr. Aker noted that the groundwater table is at 150-160 feet bgs. Ms. Valiela suggested that it is not known that the northern hemisphere of the Sagamore groundwater lens is pristine, only that it has been unexplored. Ms. Valiela stated that another justification for the ten pairs of test wells is to verify that the groundwater in this area is pristine.

Mr. Karson proceeded to introduce Mr. Barret Borry with the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) for a discussion of the Site Inspections conducted at CS-18 and CS-19.

USACHPPM Site Inspection of CS-18/CS-19 Fall 1994, Mr. Barret Borry, USACHPPM

Mr. Borry stated that past training at the site of CS-18 included burning of propellant bags at gunnery position GP-9 which was selected as being representative of artillery positions. He stated that this site is located north of the cantonment area and south of the impact area. He added that this is one of the most heavily used firing points. He explained that the cantonment area contains the general administration buildings and troop living quarters. Mr. Borry stated that the artillery propellant is packed in increments to fire one round its maximum range. However, the firing range at Camp Edwards is much less than the maximum range resulting in excess unstable powder which had been disposed of by burning. Mr. Borry stated that these activities had been conducted for forty years and was terminated in 1991. Ms. Buntich asked for the quantity of propellant contained in one package. Mr. Borry stated that it depends on the

projectile.

Mr. Borry stated that the sampling strategy for this site was based on sampling soils and groundwater at the most heavily used site, with soil samples collected at 0-1 feet, 2-4 feet, 5-7 feet and analyzed for Resource Conservation and Recovery Act (RCRA) metals, explosives, and semi-volatile organic compounds (SVOCs). He noted that 15 locations were sampled at GP-9, with a total of 64 samples collected. He added that photo-ionization detector (PID) readings were used to determine the placement of groundwater sampling wells with the assumption that groundwater flowed at the site from east to west.

Mr. Borry stated that the analytical results for site soils indicated varying amount of explosives, mostly in the upper one foot of soil with minor amounts of the metals arsenic, chromium, and lead. He noted that these results were randomly scattered, but that the levels for explosives were above background. Mr. Borry stated that groundwater was encountered at elevations of 67-68 feet above mean sea level (msl) (80-84 feet bgs) with only minor amounts of a few organics detected. He noted that no MCLs were exceeded. Regarding the Preliminary Risk Evaluation (PRE) for the site, the human health assessment indicated that current or future risk due to onsite contamination is highly unlikely. Regarding the ecological risk assessment, Mr. Borry stated that recolonization of the site by plant species is not expected to be impacted. He added that the physical habitat and soil conditions precludes use by potential receptor species and that the risk to predatory mammals is minimal. Mr. LaPointe asked when the last time propellant was fired. Mr. Borry responded that artillery is still fired, but that the expended propellant bags have not been burned since 1991. Ms. Valiela stated that burning ceased shortly after Maj. Gen. Raymond Vezina became Adjutant General. Mr. LaPointe asked to what depth soil samples were collected. Mr. Borry answered to seven feet. Mr. LaPointe asked what the effect of these compounds would be when they enter the aquifer. Mr. Borry stated that contaminants were not detected in the groundwater above MCLs and that the concentrations in soils decreased with depth. He suggested that these contaminants are immobile in soil and are not expected to migrate to the groundwater. He reiterated that the Preliminary Risk Evaluation did not indicate any health risks. Mr. Dick Prince stated that it his understanding that mortar bags are still burned. Col. Labrie stated that mortar bag burning is still allowed based on an evaluation that the chemicals released during the burning did not pose a risk. Regarding spent artillery propellant bags, Col. Labrie stated that they are currently gathered, stored, and shipped back to the munitions depot from which they originated. In an answer to Ms. Buntich's earlier question, Col. Labrie noted that mortar propellant bags are about the size of a "bagel bag" and that a propellant bag for a 150mm Howitzer shell is about twice that size. Mr. David Jacobsen added that the mortar propellant bags are no longer burned on the ground, but are burned in bins instead.

Mr. George Seaver asked if groundwater was sampled downgradient of GP-9. Mr. Borry stated that it was and that nothing was found. Mr. Seaver asked for clarification. Mr. Borry replied that all detections were below normal reporting limits. He noted that chloroform was detected at 0.2 ppb. Mr. Seaver stated that he was surprised that nothing was found in the groundwater given the levels of contaminants in the soils. Mr. Begley asked what the leaching potential of

the compounds detected in the soils is and how soluble they are. Mr. Borry stated that he could not give quantitative answers, but noted that these compounds have been detected in groundwater at other installations. He suggested that they would be expected to migrate if present in great enough quantities. However, he recommended no further action at GP-9.

Mr. Borry proceeded to discuss the investigations conducted at CS-19. He stated that this site, located within the impact area, was the potential site of propellant burning, fuel disposal and ordinance disposal. He noted that this site is approximately 2,000 feet northeast of Siaconsett Pond. Mr. Borry added that this site is pitted and littered with rocket debris and that there is a potential for unexploded ordinance to be present. However, he stated that there are no known records of disposal at this site. Mr. Borry stated that during previous investigations, soil sampling identified the locations of three former burn pits related to practices in the late 1960s. He stated that the current investigations focused on groundwater with the installation of four monitoring wells around the site. Mr. Borry noted that groundwater was encountered at 67-68 feet msl or approximately 116 feet bgs. He added that water level data did not conclusively indicate flow direction. Mr. Borry stated that no MCLs were exceeded, however the propellant RDX was detected in two of the wells at concentrations up to 21 ppb. He noted that the EPA has issued a health advisory for RDX with a lifetime exposure of 2 ppb. He stated that the Preliminary Risk Evaluation is currently being conducted. Mr. Seaver asked for clarification that the RDX was encountered at only two of the wells. Mr. Borry answered that was correct and added that this was only based on one round of sampling. Mr. Seaver asked if these detections were at the water table. Mr. Borry replied that samples were collected from the top six to seven feet of the water table. Mr. Marchessault stated that the report is due to the regulators in June and that this is only preliminary information. Mr. Seaver suggested with this site being located at the top of the groundwater mound, it should have the highest priority ranking for further investigation. Mr. Minior cautioned that these results are based on only one round of sampling and that the monitoring wells would be resampled. Ms. Valiela agreed with Mr. Seaver that an understanding of the direction of groundwater flow in this area is important.

Mr. Seaver proposed the installation of iron moorings or iron filings at the interface of the plumes with Ashumet Pond as a possible means for addressing the nutrient loading by phosphorus. Mr. Karson stated that that is something that the 102 Fighter Wing should evaluate, as they are funding work on the phosphorus issue.

Mr. Karson introduced Mr. Binks Colby-George for a brief introduction to the posterboard session on "Lake Influence on Deep Plume Migration".

Lake Influence on Deep Plume Migration, Mr. Binks Colby-George, ABB-ES

Mr. Colby-George stated that a large amount of data has been collected regarding the interaction between the plumes, aquifer, and large ponds surrounding the MMR. Specifically, he stated that the Storm Drain (SD)-5 solvent plume had been studied in detail as part of the Southeast Regional Groundwater Operable Unit (SERGOU) investigation. Mr. Colby-George stated that

this plume is being drawn upward in Johns Pond. He stated that the results of these studies are presented in a posterboard session that would be available during the break. He noted that Johns Pond is a surface expression of the groundwater.

Remedial Actions Update, Mr. Ed Pesce, NGB

Mr. Pesce presented an update on the various on-going remedial actions at the MMR. He stated that the statement of work (SOW) has been finalized for the CS-4 groundwater extraction and treatment system tracer test. He noted that groundwater sampling of 13 monitoring wells at the extraction site is ongoing as part of the basewide groundwater monitoring contract. However, as part of the tracer test, Mr. Pesce stated that a total of 40 observation wells will be monitored to better understand how the system is operating. Mr. Jacobs asked how the timing of the tracer test would mesh with the remedial design for the other plumes. Mr. Pesce suggested that some benefit could be obtained from the data, but cautioned that the timing is tight. Mr. Jacobs asked when the CS-4 system would begin to pick up the majority of the plume. Mr. Pesce stated that the system is currently extracting clean as well as contaminated water and that it would probably be a couple of years before the 50 ppb solvent concentrations are drawn into the extraction wells. Mr. Seaver suggested that with the plume migrating at 1 foot per day the leading edge should have moved 500 feet towards the extraction fence and that higher concentrations should be entering the system. A discussion ensued on this issue. Ms. Valiela underscored Mr. Jacobs' comments regarding the importance of the tracer test on the remedial design to be conducted by OpTech. Ms. Valiela stated that this tracer test had been discussed for over a year without being implemented and that this project is vital to determining whether containment would actually work. Mr. Pesce stated that some of the fieldwork for the tracer test would begin this summer and that it may be possible to use some of the data in the remedial design, but questioned whether data from the CS-4 site would truly be applicable to the other plumes.

Mr. Pesce stated that the work at LF-1 has been "semi-dormant" due to weather and difficulties that would be encountered in attempting to place a clay liner during periods of heavy rain and freezing temperatures. He noted that the entire project is approximately two-thirds complete and that the final cap for the kettle hole would begin in April. Mr. Pesce stated that the construction of the following items or phases has been completed: subgrade fill, gas venting sand layer, settlement monitoring period, storm water perimeter drainage system, drainage sand placement, CS-9 remediation/soil removal, liner/cover system construction on 1970 and post-1970 waste cells. Mr. Pesce stated that the final construction after the liner is the vegetative cover and that the contractor is starting to spread the loam piles and that one seeding season could be accomplished this year. He stated that the projected completion date is Thanksgiving. Mr. Minior raised the issue of a possible vegetative cover change. Mr. Pesce stated that discussions have been held on the possibility of using a seed mixture that favors the habitats of threatened species. Ms. Buntich asked if there would be any post-closure uses. Mr. Pesce stated that there would not be, but that post-closure monitoring would be conducted, including air monitoring, groundwater monitoring and general condition.

Mr. Pesce proceeded to discuss the project for excavation and thermal treatment of contaminated soils. He stated that 100 percent of the CS-4 soils, 100 percent of the FS-25 soils, and 40 percent of the CS-9 soils have been treated. He added that discussions are ongoing with the regulators regarding the remediation of other small source areas of contaminated soils by thermal treatment. Mr. Pesce stated that the next step in the process would be the treatment of petroleum hydrocarbon contaminated soils at FTA-1 and that, due to higher levels of contamination being encountered than had been expected, the contract is being modified. He stated that he expected startup no later than May.

Regarding the FS-12 source removal action, Mr. Pesce stated that site clearing, site fencing, and the installation of air sparging wells has resulted in completion of approximately 20 percent of the project. He added that of the 21 soil venting wells, 14 have been completed. He stated that the process of providing an activated carbon off-gas treatment system in addition to catalytic oxidation is underway and would result in a system that will not release volatiles to the atmosphere. Ms. Buntich asked Mr. Pesce when he anticipated obtaining the carbon system and asked if this could be easily retrofitted. Mr. Pesce stated that it has been decided to use a mobile unit for the catalytic oxidation unit, consisting of two trailers, one of which would house the carbon treatment system. He stated that this mobile unit could be used elsewhere in the future. Mr. LaPointe thanked the NGB for agreeing to install the carbon off-gas treatment, but questioned possible technical difficulties due to tremendous air flow through the unit. Mr. Pesce stated that this engineering problem has been solved. Mr. LaPointe suggested another possible deficiency, that of the wells not being individually regulated for air pressure and air flow and asked if air quality monitoring would be conducted in the vicinity of the air sparging wells. Mr. Pesce stated that the vacuum extraction wells extract vaporized EDB and that the pulsing cycle will provide negative pressure at the venting wells at all time. He stated that an air monitoring device would be installed at the exhaust stack. He added that the entire system can be regulated for air flow and that this issue could be further discussed with Atlantic Environmental Technologies and acknowledged the need to be able to vary the system and added that the catalytic oxidation system could be shut off in the future. Mr. Pesce stated that the flexibility to adjust the system was built into the design. Mr. LaPointe suggested that it is necessary to be able to regulate the system at each individual well. Mr. Pesce stated that variability is built into the design. Regarding the schedule for operation of the system, Mr. Pesce stated that the Remedial Action Work Plan which would include provisions for an add-on carbon system is expected to be approved in April and that treatment system assembly and component tests would be conducted in June or July with full system start-up expected in August.

Mr. Pesce stated that the University of Waterloo has completed the laboratory bench scale treatability study for the permeable reactive wall pilot test as well as an evaluation of CS-10 for a pile driving test. He stated that on Tuesday the University of Waterloo staff would be at the MMR to discuss the SOW and set up a schedule for determining the feasibility of treatment and construction in the CS-10 plume, which is at a greater depth than the original site, Fire Training Area (FTA)-1. Mr. Seaver asked Mr. Pesce to comment on the delays in the project. Mr. Pesce stated that it took an inordinate amount of time to complete the sole source justification and then to move through the Canadian bureaucracy. He noted that the IRP is in its infancy

regarding the use of innovative technologies, but noted that a public/private partnership is being established to provide project validation.

Mr. Pesce stated that over 180 structures are to be demolished and removed as part of the drainage structure removal program. He noted that the 90 percent design is in revision and that the NGB has submitted soil target cleanup levels to the regulators for approval. Regarding the schedule, Mr. Pesce stated that the contract bid period is planned for April and May with award in June and an estimated project start date of August. However, he cautioned that this estimated project start date may be a little optimistic.

Mr. Pesce stated that the abandoned aqua-fuel system project involved the removal of out of service underground storage tanks in the SD-5 source area. Summarizing the work, Mr. Pesce stated that it included pumping and removing the water contents of 17 USTs, ten of which are 25,000 gallon tanks and seven are 550 gallon tanks, the removal and disposal of the tanks, piping, fittings, and valves, removing concrete filling stands and structures, and conducting soil sampling and analysis to confirm that the excavations were clean. Mr. Pesce stated that the project was completed on March 10, resulting in approximately 450 cubic yards of contaminated soil to be thermally treated.

Mr. Pesce proceeded to show slides of the various remedial projects.

Regarding FS-13, Ms. Valiela asked if the NGB intends to remove the pipeline. Mr. Minior stated that this is an investigation to determine if there had been a release at FS-13 and that it was not the intent of the project to remove the pipeline.

Regarding LF-1, Mr. Seaver asked if it could be assumed that the pre-1970 cells are benign. Mr. Pesce stated that this may be the case for residential landfills. Mr. Seaver asked then why the NGB is not capping the 1947 and 1950 cells. Mr. Pesce stated that an agreement was made with the regulators that these cells were not acting as a source of groundwater contamination. Mr. Marchessault clarified that the Interim Record of Decision (ROD) resulted in the LF-1 cap and that it was decided at the time that the 1947, 1951, and 1957 cells had not been proven to be contributing to the LF-1 plume. However, based on the results of the LF-1 Remedial Investigation it will be decided if any actions needs to be taken on the remaining three landfill cells. Mr. Seaver agreed that the shape of the plume would probably be different if contamination was coming from the earlier cells. Mr. Marchessault cautioned against making that general assumption. Mr. Begley suggested that there may be other problems associated with the older cells. Mr. Seaver added that the Town of Bourne has five landfills about which little is known.

Ms. Buntich expressed her concern regarding the equipment vandalism on the MMR. Mr. Karson stated that the State Police is patrolling the MMR on a regular basis.

Mr. Karson stated that a public meeting of the FS-12 subcommittee is being scheduled to present the NGB's intended actions. Ms. Buntich asked when the subcommittee meeting would be held.

Mr. Karson stated that it would be before the beginning of the formal public comment period.

Mr. Karson introduced Mr. Don Hudson for a discussion of the CS-16/CS-17 Drum Disposal Operable Unit (DDOU) Fieldwork.

CS-16/CS-17 Drum Disposal Operable Unit Fieldwork Summary, Mr. Don Hudson, ASI

Mr. Hudson stated that eleven drums were discovered at this site by ABB-ES during the CS-16/CS-17 Remedial Investigation in March 1994. He noted that at that time ABB-ES collected two surface soil samples from the drum disposal operable unit (DDOU) and the analyses found volatile organic compound (VOC), SVOC, pesticide, and inorganic contamination present at the DDOU and at a depression approximately 130 feet west of the DDOU. He added that pesticides were the primary contaminants of concern. Mr. Hudson stated that the NGB promptly removed the eleven drums from the site and that the four drums containing liquids were sampled and found to be uncontaminated.

Mr. Hudson stated that in November 1994 Advanced Sciences, Inc. (ASI) conducted a preliminary site characterization of the CS-16/CS-17 DDOU to determine the nature and extent of contamination. Mr. Hudson stated that ASI's field activities included 24 Geoprobe borings completed to 12 feet with samples collected at 0-2 feet, 5-7 feet, and 10-12 feet analyzed with immunoassay kits for DDT contamination. These borings were completed at each of the eleven drum locations; eleven completed in close proximity to the drum sites, attempting to establish an approximate perimeter surrounding the area; and two borings completed at the small depression west of the DDOU. He added that two of the borings were completed as upgradient and downgradient water table monitoring wells at approximately 50 feet. Mr. Hudson added that soil samples were collected during monitoring well installation at 0-2 feet and the capillary fringe with analysis by Contract Laboratory Program (CLP) for VOCs, SVOCs, pesticides/polychlorinated biphenyls (pcbs), and inorganics. Mr. Hudson stated that two additional water table monitoring wells were completed at the two areas of highest detections based on field and lab test results. Soil samples were collected from these monitoring wells installations at 0-2 feet, 10-12 feet, and the capillary fringe for CLP analysis. He added that soil samples were also collected at 20-22 feet, 30-32 feet, and 40-42 feet for immunoassay analysis for DDT. Furthermore, Mr. Hudson stated that ten surface soil samples were collected for CLP analysis, eight located at the DDOU area and two at the depression west of the DDOU.

Mr. Hudson stated that the Geoprobe Immunoassay results indicated pesticides at nine of the 11 drum borings and no pesticides at the eleven perimeter borings or the depression west of the DDOU.

Mr. Hudson stated that pesticides were the primary contaminant of concern from the soil borings and surface soil samples.

Mr. Karson stated that this concludes the agenda for today's TEAC meeting and that the next

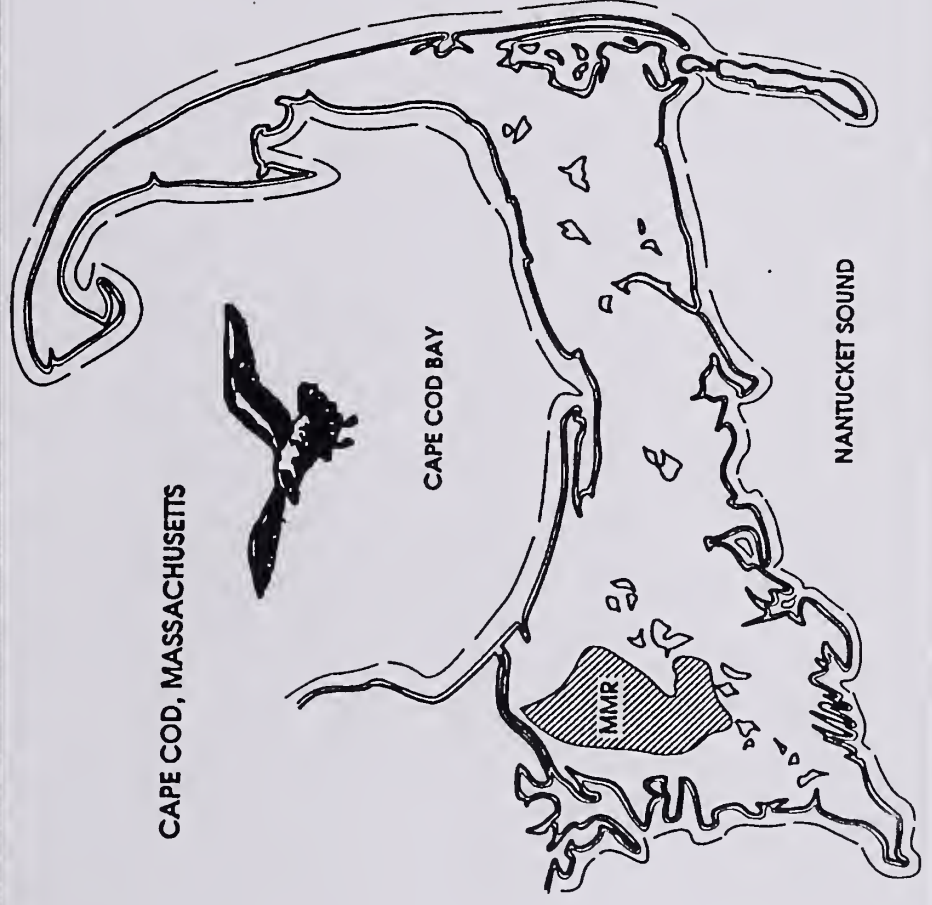
meeting of the TEAC is scheduled for May 17, 7 p.m., at Morse Pond School in Falmouth.
The 54th meeting of the Technical Environmental Affairs Committee adjourned at 1:20 p.m.

54th MEETING OF THE

Technical Environmental Affairs Committee

INSTALLATION RESTORATION PROGRAM
MASSACHUSETTS MILITARY RESERVATION

March 22, 1995



AGENDA

Technical Environmental Affairs Committee

March 23, 1995

- 1. Plume Response Plan**
 - Design Contract Activities (NGB)**
 - Management Plan Activities (CH2M Hill)**
- 2. Basewide Ethylene Dibromide Update (NGB)**
- 3. Investigative Actions Update (NGB)**
- 4. "Lake Influence on Deep Plume Migration" (ABB-ES)**
 - Summary**
 - Posterboard Session (During Break)**
- 5. Remedial Actions Update (NGB)**
- 6. CS-16/CS-17 Drum Disposal Operable Unit Field Work Summary (ASI)**

PLUME RESPONSE PLAN DESIGN CONTRACT ACTIVITIES

Michael Minor, NGB

PLUME RESPONSE PLAN MANAGEMENT PLAN ACTIVITIES

Cliff Bell, CH2M HILL

ISSUES

- Kickoff Meeting
- Update Strategy
- Other Issues
- ● Property Access
- ● Peer Review

KICKOFF MEETING

- Players
- Logistics and Day-to-Day Operations
- ● Daily Communications
- ● Meetings
- Highlights of Kickoff Meeting Effecting Schedule

UPDATE STRATEGY TO GET BACK ON TRACK

- **Concurrency**
- **Technical Status Update Meetings**

OTHER ISSUES

- **Property Access**
- **Peer Review**

NEXT STEPS

- **Summarize**
- **Time and Place for the Next Update**
- **Discussion**

BASEWIDE ETHYLENE DIBROMIDE UPDATE

Marty Aker, NGB

ETHYLENE DIBROMIDE

- **HAZWRAP Under Contract to Provide Basewide Ethylene Dibromide (EDB) Map**
- ● **Serve as Basis for Our Approach**
- **Resample Wells in Crane Wildlife Management Area and Install Up to 10 Monitoring Wells**
- **Private Well Testing Conducted in Hatchville, South of the Area, as a Precaution**

INVESTIGATIVE ACTIONS UPDATE

Marty Aker, NGB

INVESTIGATIONS UPDATE

- **Basewide Monitoring and Sampling Program**
- **MMR Test Well Installation**
- **CS-18/CS-19 Site Investigations**
- **FS-13/FS-14 Site Investigations**
- **FS-7 Supplemental Site Investigation**

BASEWIDE MONITORING AND SAMPLING

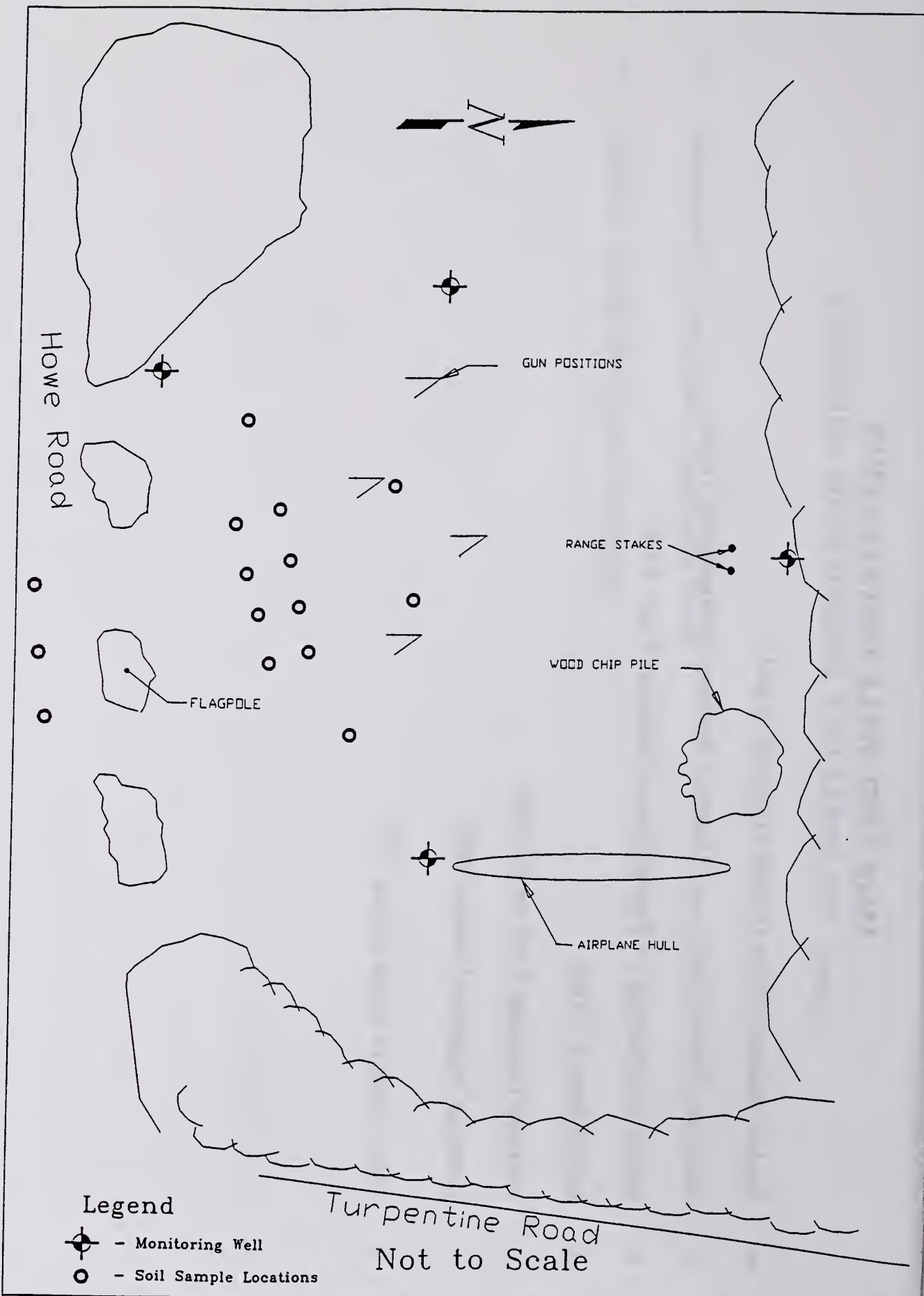
- **Monitor Edge of Plumes, Overall Status of Plumes, and Individual Well Status**
- **375 Wells Involved in Program**
- **First Event Completed in December 1994**
- **Report Delivered February 1995**
- **Next Sampling Event March 1995**

BASEWIDE MONITORING AND SAMPLING (cont.)

- **Scheduled for Five Years - Renewable Yearly**
- **Database Will Be Set Up to Access Data**

MMR TEST WELL INSTALLATION

- **Replace Bourne Water District Wells No. 2 and 5**
- **Ascertain Water Quality and Quantity for Four Surrounding Towns**
- **Install Ten Pairs of 2" Test Wells and Perform Pump Tests**
- **Install Four 8" Wells**
- **Perform Pumping Tests on 8" Wells**
- **Contract Negotiated March 1995**
- **Field Work to Begin Spring 1995**



US ARMY ENVIRONMENTAL HYGIENE AGENCY
WASTE DISPOSAL ENGINEERING DIVISION
ABERDEEN PROVING GROUND, MARYLAND

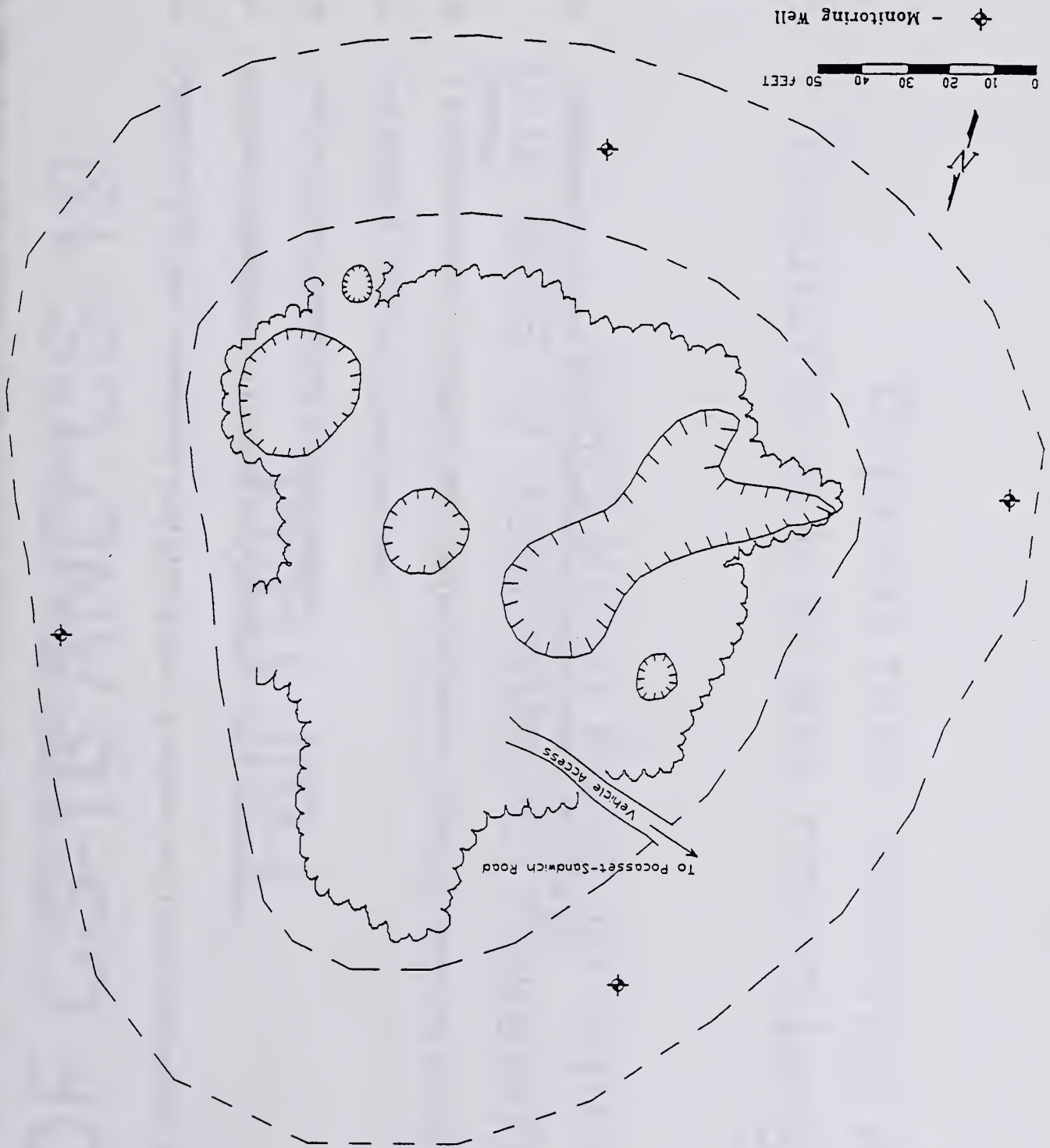
Figure 3
CS-18 (GP-9) Site Map



US ARMY ENVIRONMENTAL HYGIENE AGENCY
WASTE DISPOSAL ENGINEERING DIVISION
ABERDEEN PROVING GROUND, MARYLAND

DRAWN BY Patrick PROJECT NO 737104D1-26-K3311 FILE K3312

Figure 2
CS-19 Site Map



CS-18/CS-19 SITE INSPECTIONS

- **Chemical Spill Sites Associated with Gun Battery Positions and Underground Fuel Tank**
- **Fieldwork Completed in October and December 1994, Respectively**
- **Total of Eight Monitoring Wells Installed**
- **Soil Samples Collected - Field Screening**
- **2,4-Dinitrotoluene (2,4-DNT) and 2,6-Dinitrotoluene (2,6-DNT) Detected in Near Surface Soil Samples**
- **Groundwater Results Below Maximum Contaminant Levels (MCLs)**

OF CS-18 AND CS-19

Fall 1994

CS-18 - Detailed investigation of soils and ground water of firing point GP-9.

CS-19 - Suspected site of fuel dumping, ordnance disposal, and burning.



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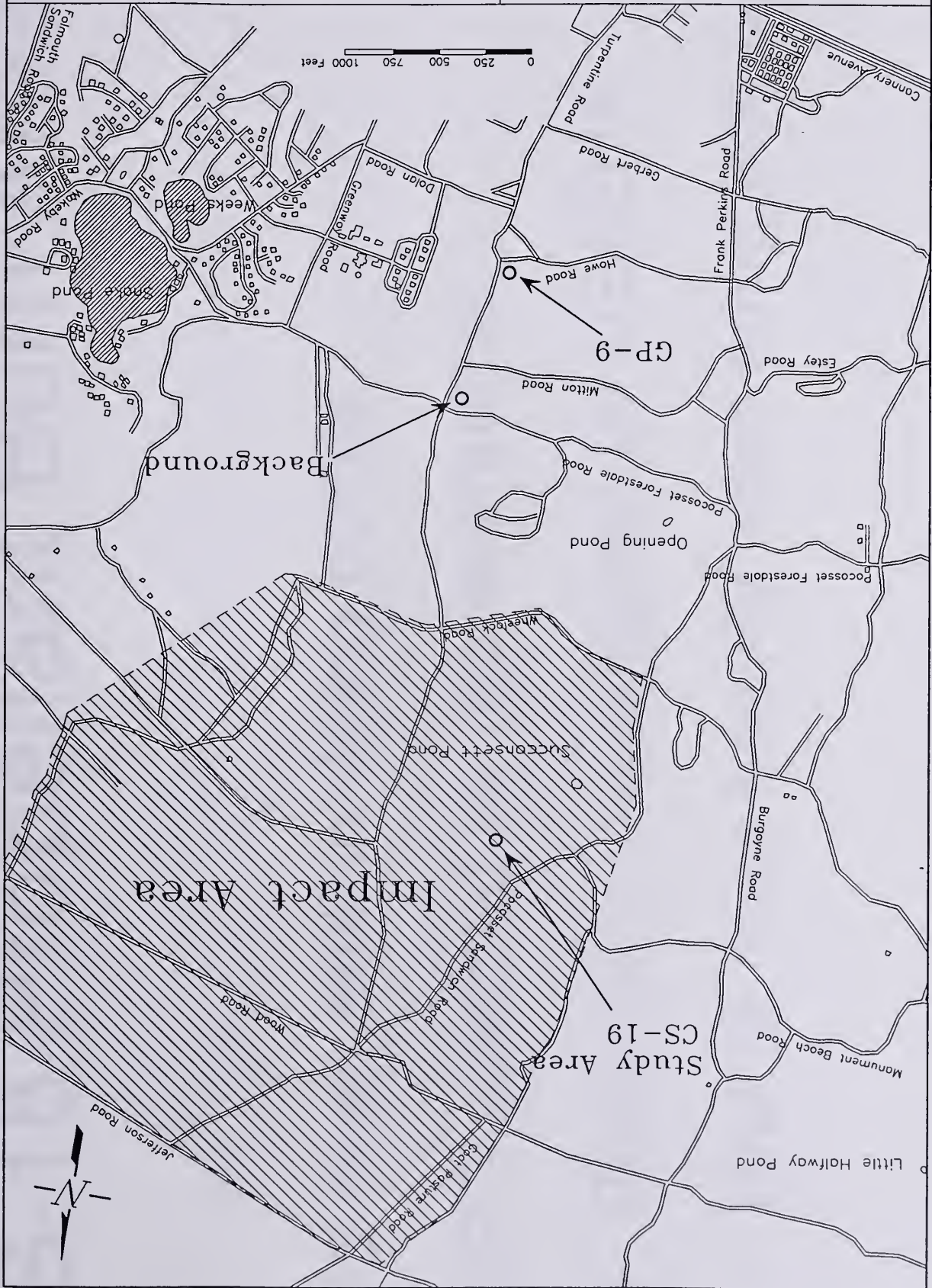
DRAWN BY Patrick Miller

PROJECT NO 73710401-26-K33U

FILE

K33UFIG2

Figure 2
MMR Study Site Location Map

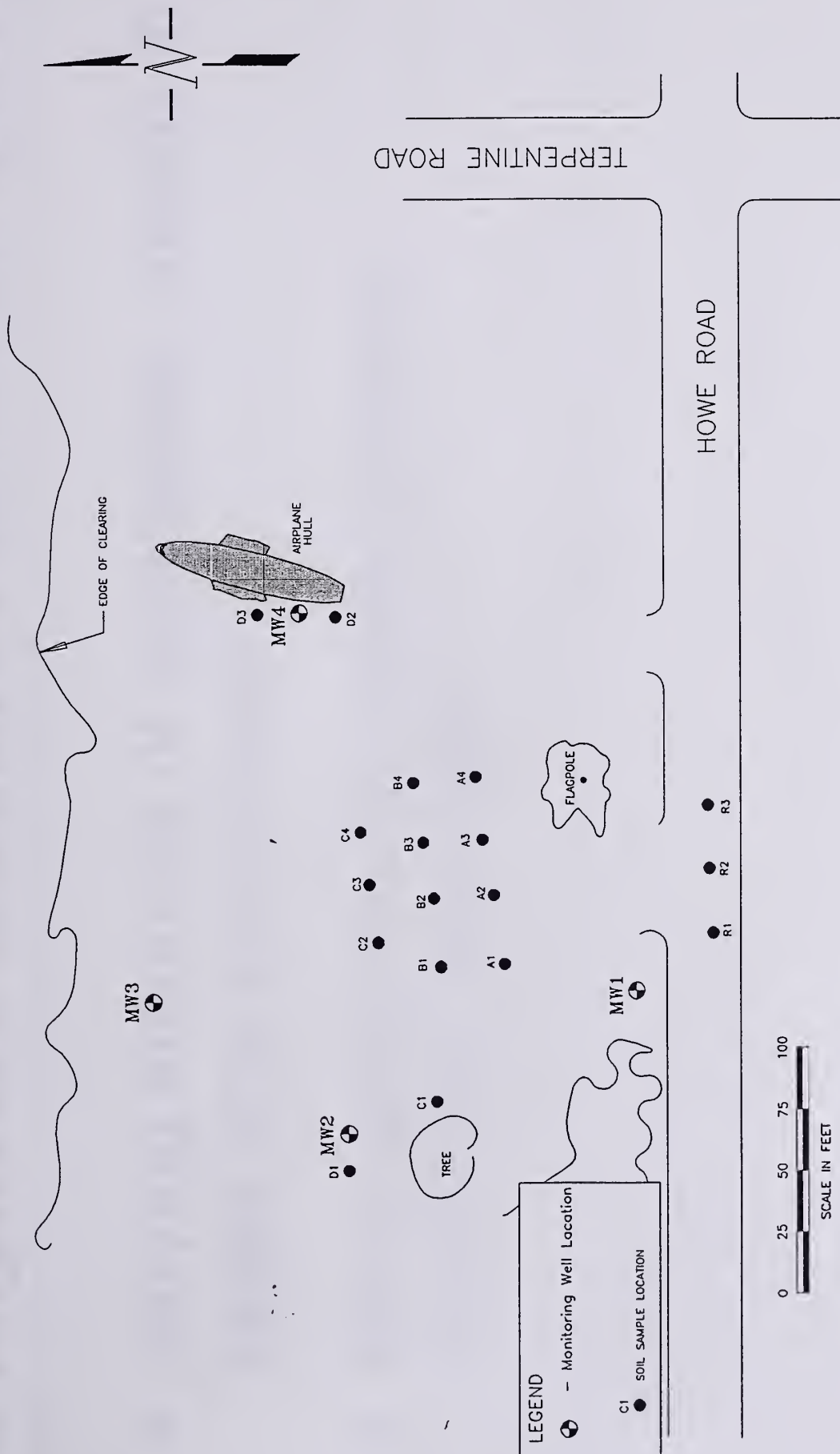


CS-18 Propellant Burn Areas

- 15 or so artillery firing points
- GP-9 selected as representative
 - ▶ Previously investigated by USAEHA
 - ▶ One of most heavily used firing points

Artillery Propellant

- One package per round, to fire maximum distance
- Firing at Camp Edwards at much less than maximum range
- Excess powder burned in rear of guns
 - ▶ In pits 2-3 feet deep
 - ▶ On the ground
 - ▶ Out in the road



WASTE DISPOSAL ENGINEERING DIVISION

FIGURE
GP-9 MONITORING WELL
AND SOIL SAMPLE LOCATIONS

DRAWN BY RCD

PROJECT NO
737104D1-26-K33U

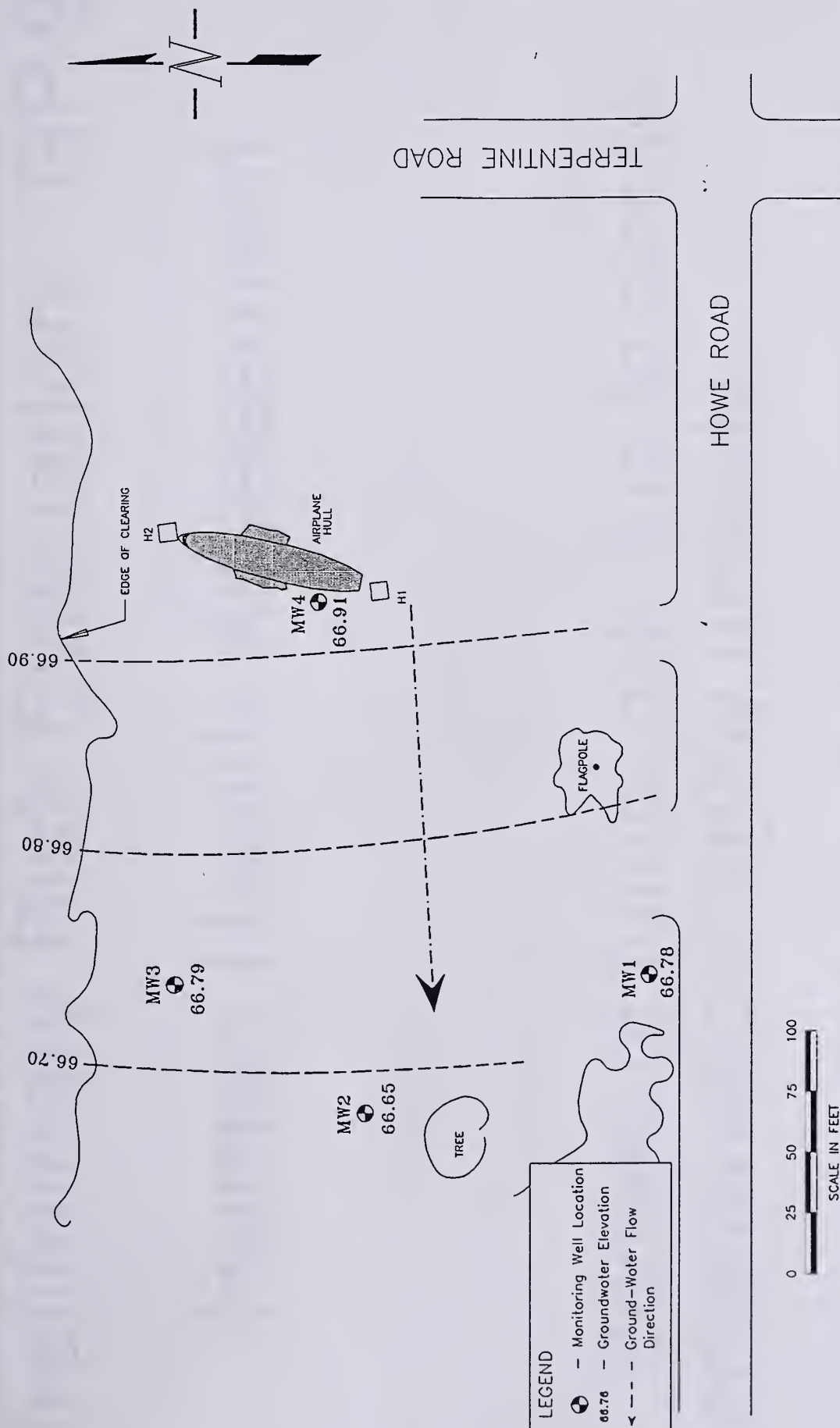
FILE
MASS SURVEY

Analytical Results - Soil Samples

- Varying amounts of explosives, mostly in upper one foot of soil
- Minor amounts of metals arsenic, chromium, and lead

Ground water at GP-9

- Ground water encountered at elevations of 67-68 feet msl
- Flow direction to the west
- Only minor amounts of a few organic compounds



WASTE DISPOSAL ENGINEERING DIVISION

FIGURE
GP-9 MONITORING WELL LOCATIONS

DRAWN BY RCD

PROJECT NO 737104D1-26-K33U

FILE MASS SURVEY

Preliminary Risk Evaluation - GP-9

Human Health Assessment

- ▶ Current or future risk due to onsite contamination highly unlikely

Ecological Risk Assessment

- ▶ Recolonization by plant species not expected to be impacted
- ▶ Physical habitat and soil conditions precludes use by potential receptor species
- ▶ Risk to predatory mammals minimal

Study Area CS-19

- Possible burning site, fuel disposal, and ordnance disposal
- No known records of disposal at site
- Site pitted and littered with metal debris
- Soils at site previously investigated

- Four monitoring wells
- Ground water encountered at elevations of 67-68 feet msl
- Flow direction not conclusively indicated
- RDX detected in two wells



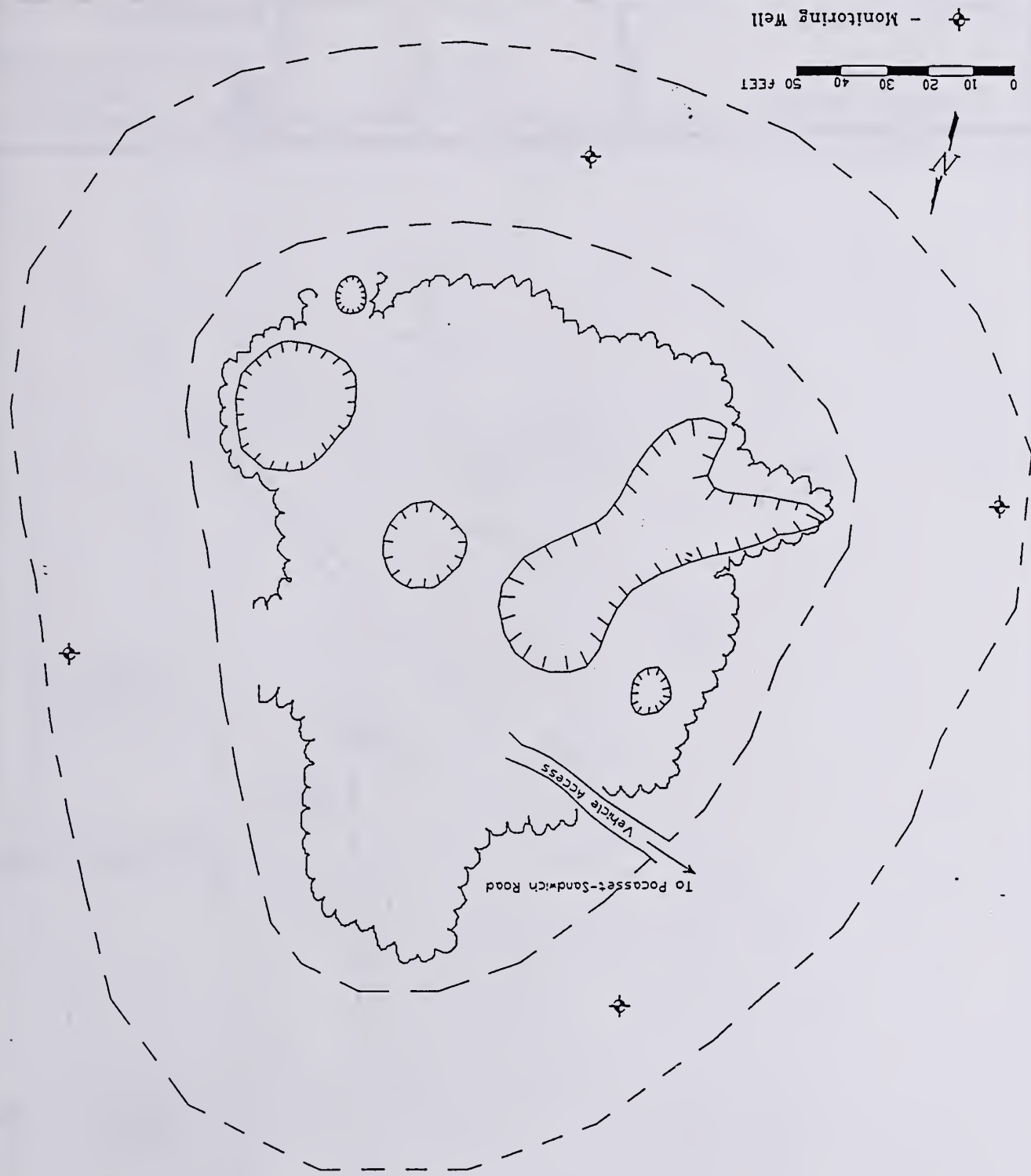
US ARMY ENVIRONMENTAL HYGIENE AGENCY
WASTE DISPOSAL ENGINEERING DIVISION
ABERDEEN PROVING GROUND, MARYLAND

DRAWN BY Patrick Miller

PROJECT NO 737104D1-26-K33U

FILE K33U2

Figure 2
CS-19 Site Map



Monitoring Well -

0 10 20 30 40 50 FEET

FIGURE 3-2

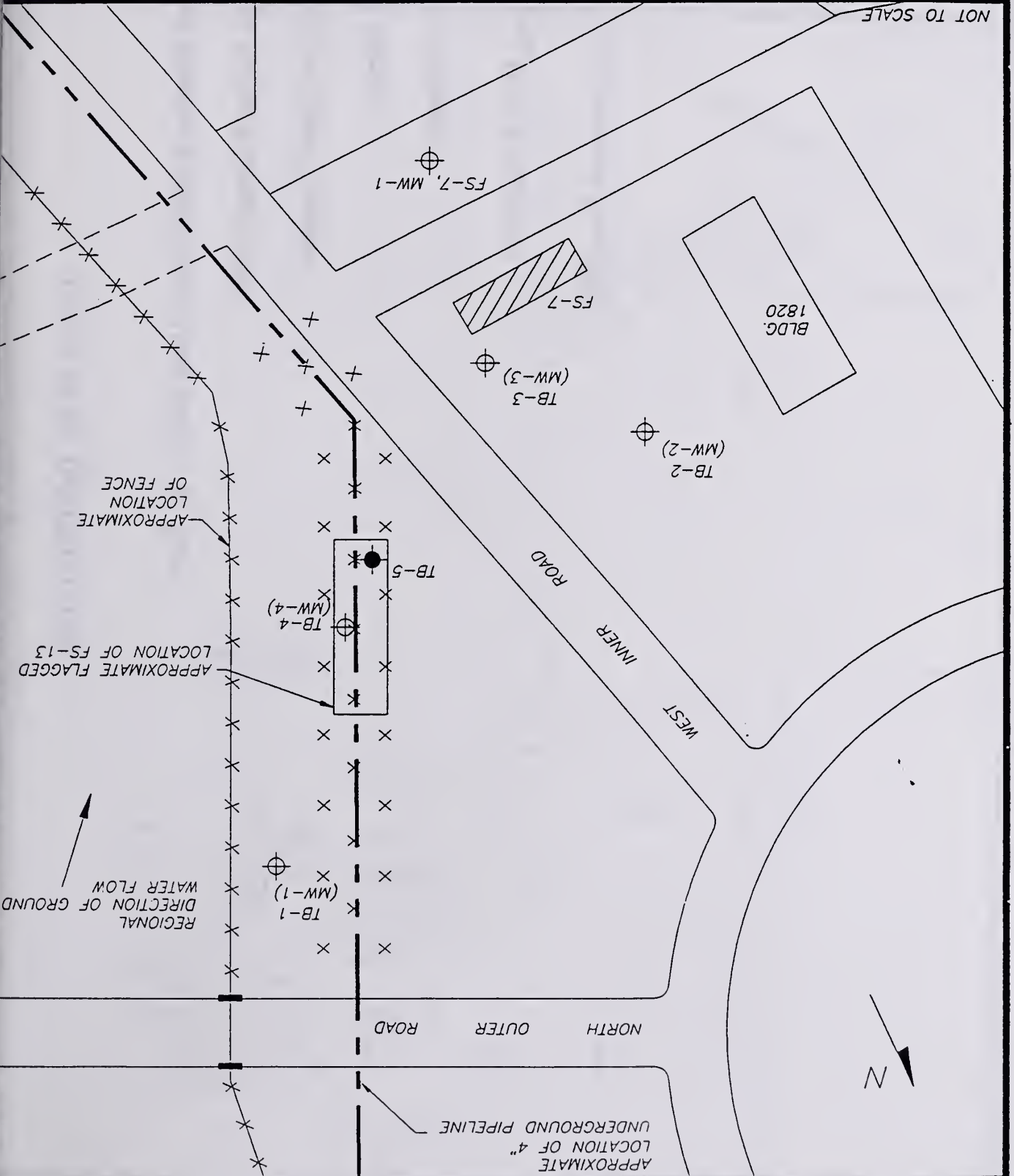


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and Process Technologies

PROPOSED SAMPLE
LOCATIONS
FS-13

- ⊕ SOIL BORING TO BE CONVERTED INTO A MONITORING WELL (SCREENED IN OVERBURDEN)
- ⊕ SOIL BORING
- × SOIL GAS SURVEY POINT
- FENCE WITH GATE
- ▨ FS-7

NOT TO SCALE



FS-13 SITE INSPECTION

- **Section of Pipeline Located Near Main Rotary on Base**
- **Fieldwork Began February 1995**
- **Metal Detector Pipe Location**
- **Soil Gas Survey**
- **Trenching Samples**
- **Monitoring Well Installation**
- **Soil and Groundwater Sampling**

FIGURE 3-4

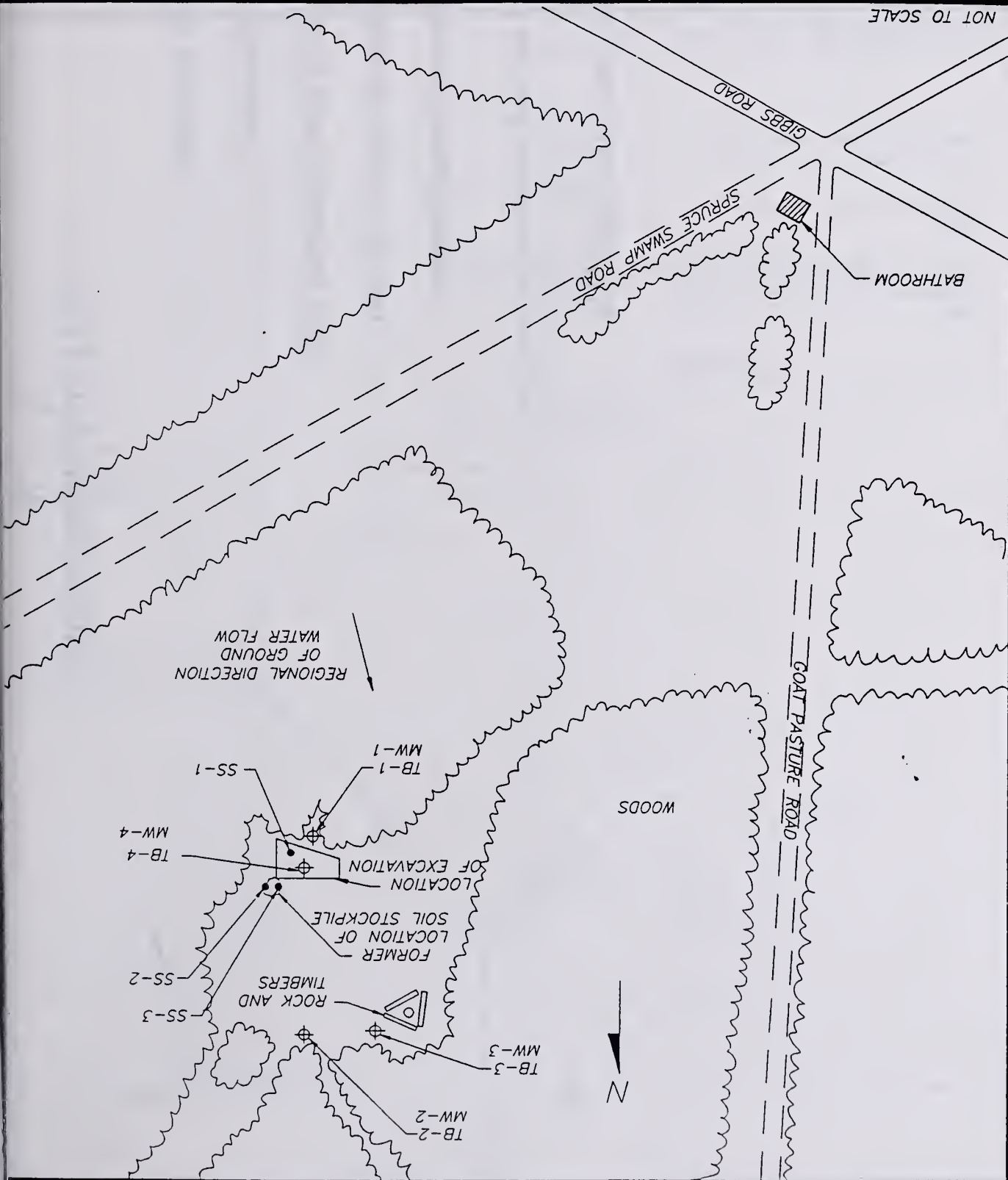
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PROPOSED SAMPLE
LOCATIONS
FS-14

• SURFACE SOIL SAMPLE
⊕ SOIL BORING TO BE CONVERTED INTO A MONITORING
WELL (SCREENED IN OVERBURDEN)

NOT TO SCALE



FS-14 SITE INSPECTION

- **800 Gallon Fuel Spill**
- **Soil Was Excavated**
- **Installation of Four Monitoring Wells**
- **Groundwater at Approx. 155 Feet**
- **Field Screening Results Negative**
- **Collected Soil and Groundwater Samples**
- **Analytical Results Due April 1995**

Scale
1" = 100'

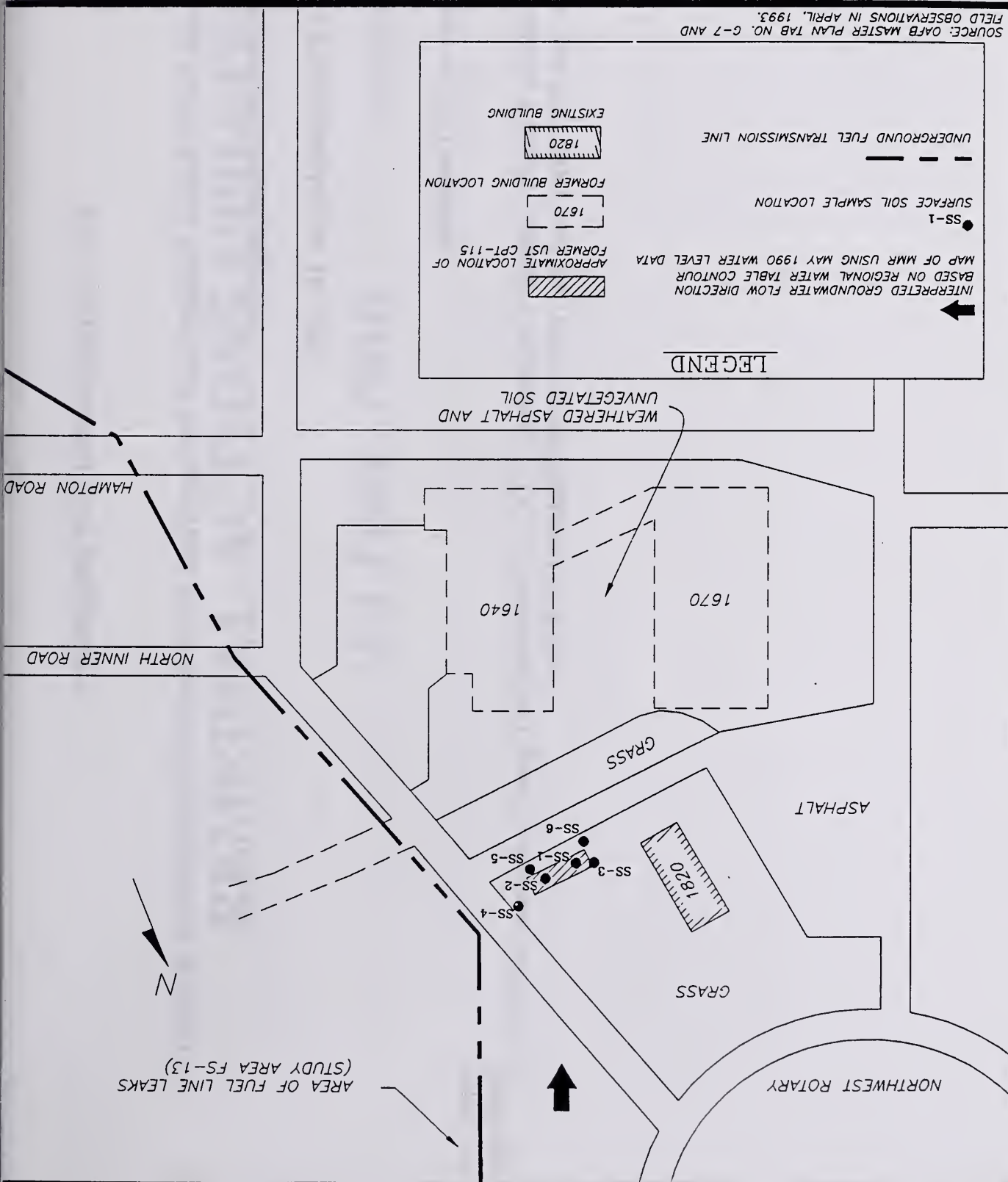
FS-7 Proposed Surface Soil Sample Locations

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FIGURE 5-1



SOURCE: OAFB MASTER PLAN TAB NO. G-7 AND
FIELD OBSERVATIONS IN APRIL, 1993.



FS-7 Supplemental Site Inspection

- Possible Leak in 550 Gallon Underground Storage Tank (UST) Located Downgradient of FS-13
- Combined with FS-13 Site Inspection
- Work Plan Completed March 10, 1995
- Test Pit at Source
- Sample Soils at Six Locations
- Analyze Soils for Volatile Organic Compounds (VOCs), Semivolatile Organic Compounds (SVOCs), Inorganics and Pesticides and Polychlorinated Biphenyls (PCBs)

REMEDIAL ACTIONS UPDATE

Ed Pesce, NGB

Remedial Action Status

Remediation Projects

- **CS-4 Groundwater Extraction and Treatment**
- **LF-1 Landfill Closure**
- **Excavation and Thermal Treatment of Soil**
- **FS-12 Source Removal Action**
- **Permeable Reactive Wall Pilot Test**
- **Drainage Structure Removal Program**
- **Aquafarm Tank Removals**

CS-4 Groundwater Extraction and Treatment System

- **Groundwater Sampling of 13 Monitoring Wells at the Extraction Site Ongoing as part of the Base-Wide Groundwater Monitoring Contract.**
- **Tests for Plume Solvents at the Treatment Plant Showed Trace Levels (Below MCLs) Entering the Plant (0.5 ppb Trichloroethylene [TCE], December 1993). The Activated Carbon Vessels are Removing All Detected Solvents.**
- **Work Plans for a Plume Tracer Test in Preparation**
 - **Test to Confirm the Extraction System Effectiveness and Provide Valuable Design Data for Future MMR Plume Containment Designs**
 - **Additional Observation Wells for Test Evaluation to be Constructed - April 1995**
 - **Actual Field Testing Planned - July/August 1995**

LF-1 Main Base Landfill Closure

- Project Approximately 67 Percent Complete
- Construction Completed of:
 - Subgrade Fill
 - Gas Venting Sand Layer
 - Settlement Monitoring Period
 - Storm Water Perimeter Drainage System
 - Drainage Sand Placement
 - CS-9 Remediation/Soil Removal
 - Liner/Cover System Construction on 1970 and Post-1970 Waste Cells

LF-1 Main Base Landfill Closure (Cont.)

- **Projected Activities**
 - **Liner System Completion on Kettle Hole Cell**
 - **Final Cover Layers (Vegetative Cover)**
 - **Storm Water/Drainage System Site Work**

Excavation and Thermal Treatment of Soil

Areas of Contamination (AOCs), CS-4, FS-25, and FTA-1 (Original Contract Sites)

- **Thermal Treatment System Progress**
 - **100 Percent of CS-4 Soil Treated**
 - **100 Percent of FS-25 Soil Treated**
 - **40 Percent of CS-9 Soil Treated**
- **Continuous Air Monitoring of VOC's at Six Locations**
 - **Inlet/Outlet of the Activated Carbon Filter**
 - **Four Site Perimeter Monitoring Stations**
- **CS-9 and FS-2 Soils Contracted for Treatment (Approximately 3,800 Cubic Yards Total)**
- **Contract Modification in Progress for Treatment of Petroleum Hydrocarbon Contaminated Soil at FTA-1**

FS-12 Source Removal Action

- **Source Area Removal Action**
 - **Air Sparging/Soil Vapor Extraction System**
- **Project Site Construction Approximately 19 Percent Complete**
 - **Initial Site Clearing/Site Survey**
 - **Perimeter Fence Construction**
 - **Construction of Soil Venting Wells and Air Sparging Wells**
- **NGB Presently Negotiating Details for the Addition of an Activated Carbon Off-Gas Treatment Unit to the Present System Configuration**
- **Remedial Action Work Plan Approval (New System) - April 1995**
- **Treatment System Assembly/Component Tests - June/July 1995**
- **Expected System Start-up - August 1995**

**Permeable Reactive Wall Pilot Test
(University of Waterloo Funnel and Gate)**

- University of Waterloo Staff Completed the Following:
 - Laboratory Bench Scale Treatability Study
 - Evaluation of CS-10 Site for a Pile Driving Test
- Original Test Site at FTA-1
 - 50 Foot Prototype Funnel and Gate
- New Pile Driving Test at a Site in the CS-10 Plume
 - Test Will Determine the Feasibility of Treatment and Construction in the CS-10 Plume,
Which is at a Greater Depth than the FTA-1 Plume
- Public/Private Partnership Program with EPA/Clean Sites, Inc., to Conduct Independent Validation of Technology

Drainage Structure Removal Program

- **Over 180 Structures to be Demolished and Removed**
- **90 Percent Design in Revision**
- **NGB Has Submitted Soil Target Cleanup Levels to the Regulators for Approval**
- **Contract Bid Period Planned - April/May 1995**
- **Contract Award Planned - June 1995**
- **Estimated Project Start - August 1995**

Abandoned Aqua-Fuel System Removal

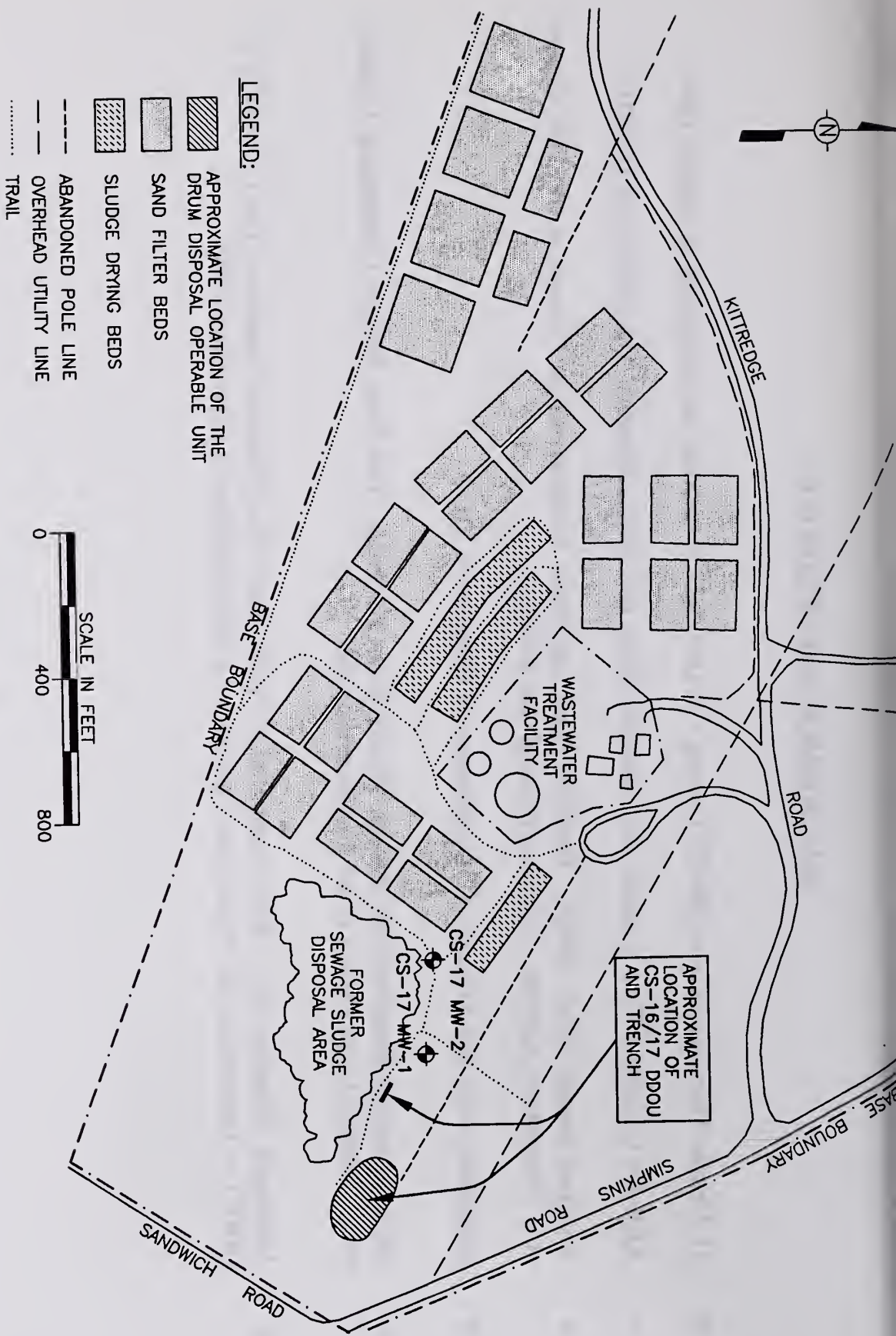
- Removal of Former Underground Storage Tanks (USTs) in the SD-5 Source Area
- Summary of Work
 - Pump and Remove Water Contents of 17 USTs
 - Ten 25,000 Gallon Tanks
 - Seven 550 Gallon Tanks
 - Removal and Disposal of Tanks, Piping, Fittings and Valves
 - Remove Concrete Filling Stands and Structures
 - Conduct Soil Sampling and Analysis to Confirm that the Excavations are Clean
- Project Status: Project Completed March 10, 1995
 - Approximately 450 Cubic Yards of Contaminated Soil Collected

**CS-16/CS-17 DRUM DISPOSAL
OPERABLE UNIT
FIELD WORK SUMMARY**

Don Hudson, ASI

BACKGROUND/PURPOSE

- 11 Drums Discovered by ABB-ES During CS-16/CS-17 Remedial Investigation in March 1994
- ABB-ES Collected Two Surface Soil Samples from the Drum Disposal Operable Unit (DDOU)
- Analyses Found VOC, SVOC, Pesticide, and Inorganic Contamination Present at the DDOU and at a Depression Approx. 130 Feet West of the DDOU
- Pesticides were the Primary Contaminants of Concern (COCs)
- NGB Promptly Removed the Eleven Drums from the Site. The Four Drums Containing Liquids Were Sampled and Found to be Uncontaminated
- Advanced Sciences, Inc. (ASI) conducted a Preliminary Site Characterization of the CS-16/CS-17 DDOU to Determine the Nature and Extent of Contamination in November 1994



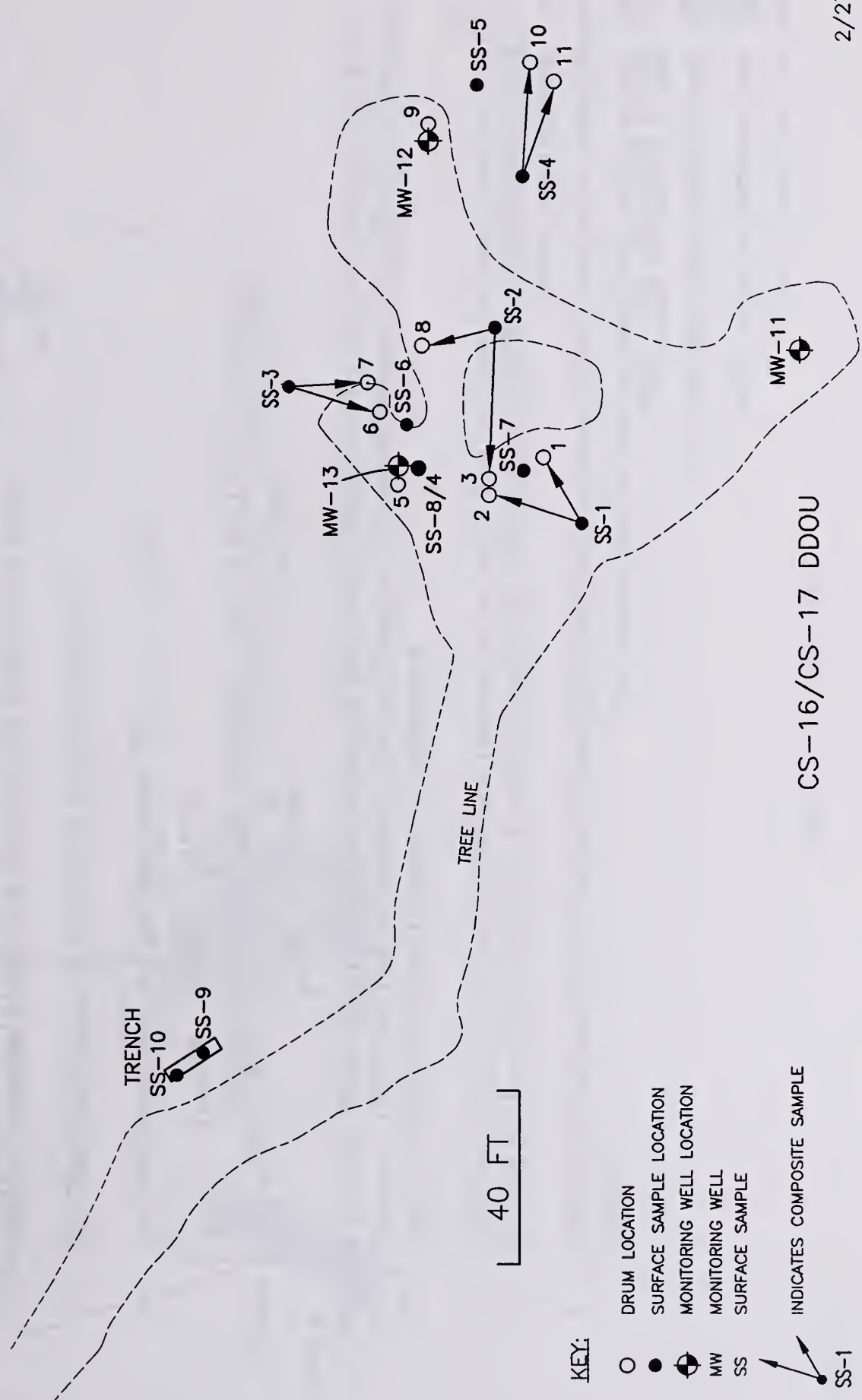
APPROXIMATE LOCATION OF THE CS-16/CS-17 DDOU

FIELD ACTIVITIES

- 24 Geoprobe Borings Completed to 12 Feet
- Samples Collected at 0-2 Feet, 5-7 Feet, and 10-12 Feet
- These Samples Were Analyzed with Immunoassay Kits for DDT Contamination - Preliminary Screening Results
- One Boring Completed at Each Location of the 11 Drums
- 11 Borings Completed in Close Proximity to the Drum Sites, Attempting to Establish an Approximate Perimeter Surrounding the Area
- Two Borings Completed at the Small Depression 130 Feet West of the DDOU
- Completed Borings for an Upgradient and a Downgradient Water Table Monitoring Well at Approx. 50 Feet
- Soil Samples Collected from Monitoring Well Installations at 0-2 Feet and Capillary Fringe, at Approx. 50-52 Feet. Samples Analyzed by Contract Laboratory Program (CLP) Lab for VOCs, SVOCs, Pesticide/PCBs, and Inorganics

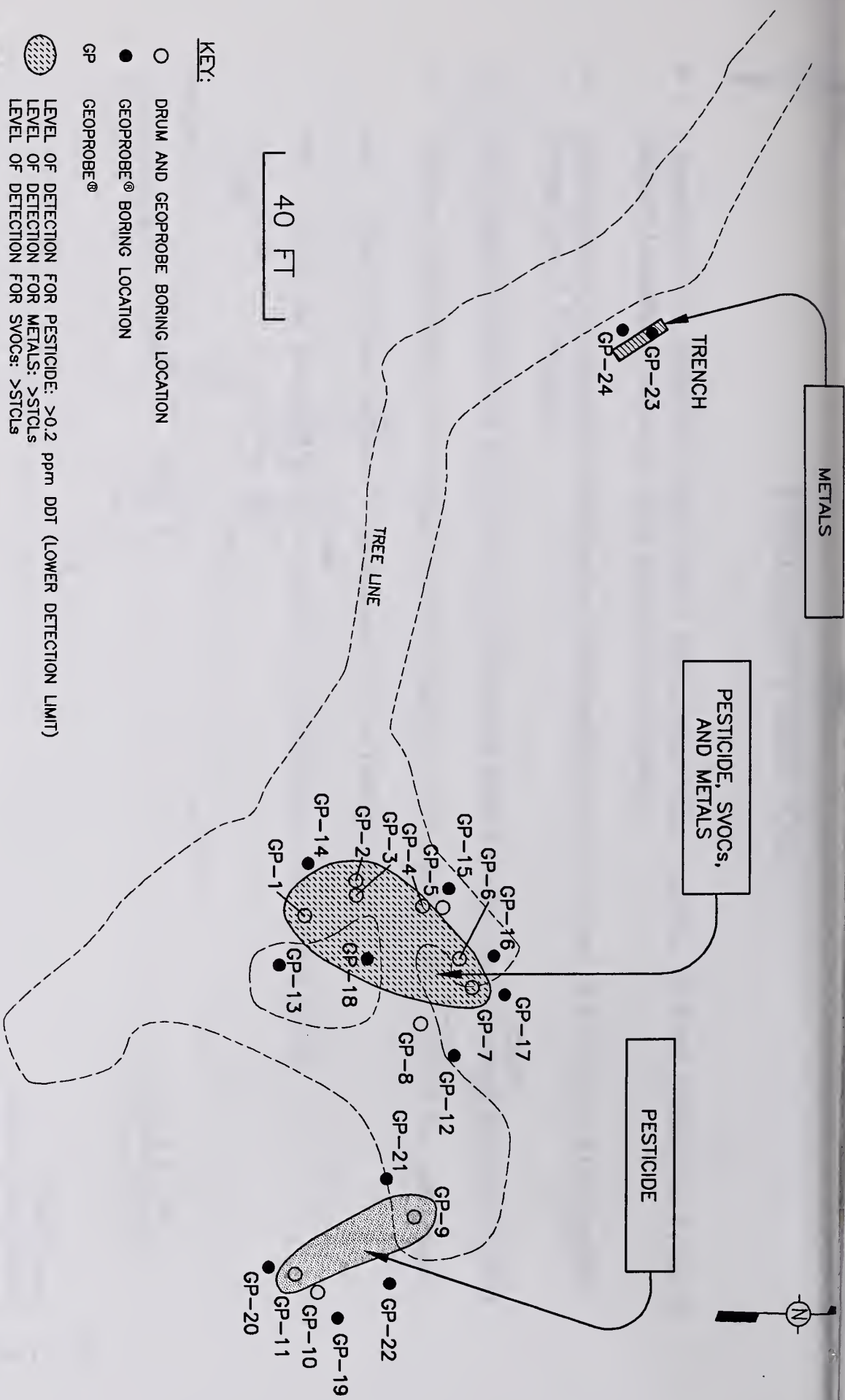
FIELD ACTIVITIES (Cont.)

- Completed Two Additional Water Table Monitoring Wells (Approx. 50 Feet) at the Two Areas of Highest Detections Based on Field and Lab Test Results
- Soil Samples Collected from Monitoring Well Installations at 0-2 Feet, 10-12 Feet, and the Capillary Fringe for CLP Analysis
- Soil Samples Collected at 20-22 Feet, 30-32 Feet, and 40-42 Feet for Immunoassay Analysis for DDT
- Collected 10 Surface Soil Samples for CLP Analysis (VOC, SVOC, Pesticides/PCBs, Inorganics)
 - Eight of These Samples Were Located at the DDOU Area
 - Two of the Samples Were Located at the Depression West of the DDOU



CS-16/CS-17 DDOU

- KEY:
- DRUM AND GEOPROBE BORING LOCATION
 - GEOPROBE® BORING LOCATION
 - GP GEOPROBE®
 - LEVEL OF DETECTION FOR PESTICIDE: >0.2 ppm DDT (LOWER DETECTION LIMIT)
 - LEVEL OF DETECTION FOR METALS: >STCLs
 - LEVEL OF DETECTION FOR SVOCs: >STCLs
 - LEVEL OF DETECTION FOR PESTICIDE: >0.2 ppm DDT
 - LEVEL OF DETECTION FOR METALS: >STCLs
 - STCL SOIL TARGET CLEAN-UP LEVELS



CS-16/CS-17 DDOU

GEOPROBE IMMUNOASSAY RESULTS

- Pesticides Found at Nine of 11 Drum Borings. Pesticide Levels Exceeded 0.2 Parts per Million (PPM) (Detection Limit) and Were Up To Twelve Feet Deep
- No Pesticides Found at the Eleven Perimeter Borings
- No Pesticides Found at the Depression West of the DDOU

RESULTS FROM SOIL BORINGS AND SURFACE SOIL SAMPLES

- Pesticides Were the Primary Contaminants and Were Discovered Within the Interval 0-12 Feet. However, DDT Was Discovered in the Deepest Sample Collected at Several of the Geoprobe Borings and, therefore, Was Not Completely Delineated
- SVOCs - 2-Bis(2-Ethylhexyl)Phthalate, Phenanthrene, and 1,2,4-Trichlorobenzene Were Discovered in Four Surface Soil Samples at Levels Exceeding the MMR Soil Target Clean-up Levels (STCLs)
- SVOCs and Metals Were Detected Primarily Within the Same Area as the Pesticides in the 0-2 Foot Interval

PROPOSED AGENDA

Technical Environmental Affairs Committee

May 1995

- 1. All Sites Status (NGB)**
- 2. Ashumet and Johns Ponds Fish Study Summary (HAZWRAP)**
- 3. SERGOU Remedial Investigation Update (ABB-ES)**
- 4. FS-1 Investigation (NGB)**
- 5. CS-16/CS-17 Remedial Investigation (NGB)**
- 6. Drainage Structure Removal Program (NGB)**
- 7. Plume Containment Design Status (CH2M Hill/OpTech)**

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